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**DRAFT ECONOMIC ANALYSIS
OF CRITICAL HABITAT DESIGNATION
FOR THE SAN BERNARDINO KANGAROO RAT**

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Prepared for:

Division of Economics
U.S. Fish and Wildlife Service
4401 N. Fairfax Drive
Arlington, VA 22203

Prepared by:

Industrial Economics, Incorporated
2067 Massachusetts Avenue
Cambridge, Massachusetts 02140

Send comments on the economic analysis to:

Field Supervisor
Carlsbad Fish and Wildlife Office
U.S. Fish and Wildlife Service
2730 Loker Avenue West
Carlsbad, California 92008

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PREFACE

On May 11, 2001, the U.S. Court of Appeals for the Tenth Circuit issued a ruling that addressed the analytical approach used by the Service to estimate the economic impacts associated with the critical habitat designation for the southwestern willow flycatcher.¹ Specifically, the court rejected the approach used by the Service to define and characterize baseline conditions.² Defining the baseline is a critical step within an economic analysis, as the baseline in turn identifies the type and magnitude of incremental impacts that are attributed to the policy or change under scrutiny. In the flycatcher analysis, the Service defined baseline conditions to include the effects associated with the listing of the flycatcher and, as is typical of many regulatory analyses, proceeded to present only the incremental effects of the rule.

The court's decision, in part, reflects the uniqueness of many of the more recent critical habitat rulemakings. Specifically, the flycatcher was initially listed by the Service as an endangered species in 1995, several years prior to designating critical habitat. Once a species has been officially listed as endangered under the Act, it is afforded special protection under Federal law. In particular, it is illegal for any one to "take" a protected species once it is listed. Take is defined to mean harass, harm pursue, hunt, shoot, wound, kill, trap, capture, collect, or to attempt to engage in any such conduct. Implementing regulations promulgated by the Service further define "harm" to mean "... an act which actually kills or injures wildlife. Such an act may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering."³

Because the southwestern willow flycatcher was initially listed as endangered by the Service in 1995, several years before the designation of critical habitat, the flycatcher, along with its habitat,

¹ New Mexico Cattle Growers Association, et al. v. U.S. Fish and Wildlife Service, No. 00-2050, U.S. Court of Appeals, Tenth Circuit, May 11, 2001.

² In a previous case, Middle Rio Grande Conservancy District v. Bruce Babbitt, No. CIV 99-870, 99-872, and 99-1445M/RLP (consolidated), U.S. District Court for the District of New Mexico, the court similarly questioned the approach used by the Service to identify the economic effects of designating critical habitat for the Rio Grande silvery minnow. Although the court openly questioned the definition used by the Service to establish the baseline of the economic analysis, the court did not expressly rule on this approach as it set aside the rule for other reasons.

³ 50 CFR 17.3. The Service's definition of harm to include significant habitat modification was later confirmed by the U.S. Supreme Court (*Sweet Home Chapter of Communities for a Great Oregon v. Babbitt*, 1F3d 1 (D.C. Cir. 1993)).

already received considerable protection before the designation of critical habitat in 1997.⁴ As a result, the economic analysis concluded that the resulting impacts of the designation would be insignificant.⁵ This conclusion was based on the facts that: (1) the designation of critical habitat only requires the Federal government to consider whether their actions could adversely modify critical habitat; and (2) the Federal government already was required to ensure that its actions did not jeopardize the flycatcher.

For a Federal action to adversely modify critical habitat the action would have to adversely affect the critical habitat's constituent elements or their management in a manner likely to appreciably diminish or preclude the role of that habitat in both the survival and recovery of the species.⁶ However, the Service defines jeopardy, which is a standard that existed prior to the designation of critical habitat for a species and is associated with its listing, as to "engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species."⁷ The "survival and recovery" standard is used in the definition of both terms (i.e., jeopardy and adverse modification) and as a result, the additional protection afforded the flycatcher due to the designation of critical habitat was determined to be negligible.

The court, however, considered why Congress would require an economic analysis performed by the Service when making a decision about designating critical habitat if in fact the designation of critical habitat adds no significant additional protection to a listed species. In the court's mind, "(b)ecause (the) economic analysis done using the FWS's baseline model is rendered essentially without meaning by 50 CFR 402.02, we conclude Congress intended that the FWS conduct a full analysis of all of the economic impacts of a critical habitat designation, regardless of whether those impacts are attributable co-extensively to other causes."⁸

Even though the court's ruling applies only to the designation of critical habitat for the southwestern willow flycatcher, this analysis attempts to comply with the court's instructions by revising the level of detail in the description of baseline conditions within the areas of proposed

⁴ See 60 FR 10694 and 62 FR 39129.

⁵ *Economic Analysis of Critical Habitat Designation for the Southwestern Willow Flycatcher*, Division of Economics, U.S. Fish and Wildlife Service, June 1997.

⁶ *Consultation Handbook*, U.S. Fish and Wildlife Service, March 1998, p. 4-39.

⁷ 50 CFR 402.02.

⁸ 50 CFR 402.02 defines the terms used by the Service in implementing sections 7(a)-(d) [16 U.S.C. 1536(a)-(d)] of the Endangered Species Act of 1973, as amended. The regulatory definitions for the terms "jeopardy" and "adverse modification" can be found in this section.

critical habitat. Specifically, this analysis quantifies, to the extent possible, the effects of section 7 in its entirety on current and planned activities that are reasonably expected to occur in the near future within proposed critical habitat. Subsequently, the analysis identifies whether these effects are associated with the jeopardy provisions of section 7 or the expected critical habitat provisions of that section. The approach to baseline definition employed in this analysis is consistent with that of previous analyses, in that the goal is to understand the *incremental* effects of a designation. Typical economic analyses concentrate mostly on identifying and measuring, to the extent feasible, economic effects most likely to occur because of the action being considered. Baseline conditions, while identified and discussed, are rarely characterized or measured in any detailed manner because by definition, these conditions remain unaffected by the outcome of the decision being contemplated.

In sum, while the goal of this analysis remains the same as previous critical habitat economic analyses (i.e., to identify and measure the estimated incremental effects of the proposed rulemaking), the implementation has been altered such that information on baseline conditions is more detailed than that presented in previous studies.

EXECUTIVE SUMMARY

1. The purpose of this report is to identify and analyze the potential economic impacts that would result from the proposed critical habitat designation for the San Bernardino kangaroo rat (*Dipodomys merriami parvus*). This report was prepared by Industrial Economics, Incorporated, for the U.S. Fish and Wildlife Service's Division of Economics.
2. Section 4(b)(2) of the Endangered Species Act (Act) requires the Service to base critical habitat proposals upon the best scientific and commercial data available, after taking into consideration the economic impact, and any other relevant impact, of specifying any particular area as critical habitat. The Service may exclude areas from critical habitat designation when the benefits of exclusion outweigh the benefits of including the areas within critical habitat, provided the exclusion will not result in extinction of the species.

Proposed Critical Habitat

3. The Service has proposed critical habitat designation for the San Bernardino kangaroo rat on approximately 55,410 acres of land in San Bernardino and Riverside counties, California. Approximately 4,260 acres, or roughly eight percent of the total acreage proposed, are located on federally owned or managed lands; 1,150 acres (2.1 percent) are owned by the Soboba Band of Mission Indians; and the remaining 50,000 (90.2 percent) of the total acreage proposed are located on State, county, water district, city, local agency, and private lands.

Framework and Economic Impacts Considered

4. This analysis examines the future impacts of section 7 of the Act on specific land uses or activities within those areas proposed as critical habitat for the kangaroo rat. Impacts include future effects associated with the listing of the species, as well as any effect of the designation above and beyond those impacts associated with listing. The listing of the species is the most significant aspect of species protection, as it provides the majority of protections by making it illegal for any person to "take" a listed species. Take is defined by the Act to mean harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct.
5. To quantify the increment of total economic burden resulting from the critical habitat designation for the kangaroo rat, the analysis evaluates a "without critical habitat" scenario and compares it to a "with critical habitat" scenario. The "without critical habitat" baseline for analysis represents current and expected economic activity under all modifications prior to critical habitat designation, including protections already accorded the kangaroo rat under Federal and State laws, such as the California Environmental Quality Act. The difference between the two scenarios measures the net change in economic activity attributable to the designation of critical habitat for the kangaroo rat.

6. To estimate the costs and benefits of section 7 implementation for the kangaroo rat on existing and planned activities and land uses occurring in the proposed critical habitat area, the following framework was applied:

1. Develop a comprehensive list of possible Federal nexuses on Federal, Tribal, State, county, municipal, and private lands in and around the proposed critical habitat area.
2. Review historical patterns and current information describing the section 7 consultations in the proposed critical habitat area to evaluate the likelihood that nexuses would result in consultations with the Service.
3. Determine whether specific projects and activities within the proposed critical habitat area involve a Federal nexus and would likely result in section 7 consultations.
4. Evaluate whether section 7 consultations with the Service would likely result in any modifications to projects, activities, or land uses.

Finally, the analysis determines the proportion of these effects associated with the proposed critical habitat designation as opposed to the listing.

7. Three primary categories of potential costs are considered in the analysis. These categories include:

- C Costs associated with conducting section 7 consultations associated with the listing or with the proposed critical habitat in the proposed critical habitat area (e.g., administrative effort).
- C Costs associated with any modifications to projects, activities, or land uses resulting from the outcome of section 7 consultation.
- C Costs associated with uncertainty and public perceptions resulting from the designation of critical habitat. Uncertainty and public perceptions about the likely effects of critical habitat that may cause project delays and changes in property values, regardless of whether critical habitat actually generates incremental impacts.

Costs of the Designation

8. The majority of future section 7 consultations within those areas proposed as critical habitat for the kangaroo rat are likely to address water district activities, flood control activities, road construction or road expansion activities, and land development. This analysis estimates that the listing and critical habitat designation will result in approximately 120 to 200 biological surveys, 170 to 280 formal and informal consultations, and five to seven re-initiations of consultations in association with activities that occur within the proposed critical habitat designation over the next ten years. In addition, it is expected that the Service will provide technical assistance to 260 to 420 parties who will make inquiries regarding uncertainty about the presence or extent of critical habitat on their lands. Designating critical habitat is also likely to add an increment of complexity to future consultations that would have resulted from the listing of the species under the Act, in that such consultations will be required to address impacts on critical habitat. In addition, many of these consultations are likely to result in Service recommendations for project modifications. Results of the economic analysis of the proposed designation of critical habitat for the kangaroo rat are summarized below by ownership category:

- C **Federal Agencies:** It is likely that the designation of critical habitat for the kangaroo rat will lead to additional or reinitiated consultations for activities Federal agencies authorize, fund, undertake, or permit. Informal and formal consultations, as well as modifications to projects and land uses, may result from critical habitat designation. Federal agencies that may consult with the Service more often as a result of the designation include the Bureau of Land Management, the Army Corps of Engineers, the Federal Aviation Authority, the Federal Highway Administration, the Bureau of Indian Affairs, the Environmental Protection Agency, and the U.S. Forest Service.
- C **Tribal Governments:** The Soboba Band of Mission Indians may be affected by critical habitat designation for kangaroo rat. There is currently an active sand mining facility on Tribal lands in the San Jacinto River. The Tribe is also likely to be involved in a consultation regarding the construction of a water percolation project within the proposed critical habitat designation. In addition, the Tribe may be involved in future road construction or development activities that are not currently planned. Activities that have a Federal nexus associated with Bureau of Indian Affairs oversight or funding of Tribal activities may be impacted by the designation of critical habitat.
- C **State and Municipal Agencies:** California State and municipal agencies likely to be affected by critical habitat designation for the kangaroo rat include the California Department of Transportation, the counties of Riverside and San Bernardino, at least 11 water districts, 11 cities, San Bernardino International Airport Authority, the State and local agencies that belong to the

Santa Ana River Wash Committee, and other local agencies. Impacts on these agencies will consist of time spent on technical assistance provided by the Service, formal and informal section 7 consultations, and modifications to planned projects.

- C Private Landowners:** The activities most likely to result in new, reinitiated, or additional consultations as a result of the designation of critical habitat for the kangaroo rat are residential, commercial, and industrial development, as well as mining and extraction activities that take place on private lands. Other activities on private land, such as farming, grazing, and recreation should not be subject to any additional or extended consultations or project modifications. Where no Federal funding, permitting, or authorization is involved, the proposed critical habitat designation creates no additional economic burden.
- C Additional Impacted Parties:** Some small construction companies, mining companies, and developers may be affected by modifications or delays to development projects that result from section 7 consultations attributable to the designation of critical habitat for the kangaroo rat. Some landowners may also experience temporary changes in property values as markets respond to the uncertainty associated with critical habitat designation. As mentioned above, the Soboba Band of Mission Indians may also be affected by the designation of critical habitat for the kangaroo rat.

Benefits of Critical Habitat

- 9. Potential benefits of the critical habitat designation include reduced uncertainty regarding the location and extent of habitat essential to the conservation of the kangaroo rat and easier identification of areas suitable for re-introduction of the kangaroo rat. The preservation of critical habitat may also result in some incremental benefits associated with alluvial fan sage scrub habitat conservation, other listed and sensitive species,⁹ and an increase in property values due to preservation of open spaces. However, it is difficult at this time to estimate the total benefit afforded by critical habitat, since little information is available regarding the following: (1) the likely outcome of each consultation and modification; and (2) the extent to which such consultations and modifications would have resulted from the listing, i.e., in the absence of critical habitat.

⁹Other listed species include the Santa Ana woolly star, and the slender-horned spineflower and other sensitive species include the Los Angeles pocket mouse.

Summary

10. The cost estimates presented in Exhibit ES-1 are an indication of the total potential costs associated with the designation of critical habitat over the next ten years. A ten-year time horizon is used because many land owners and managers do not have specific plans for projects beyond ten years. In addition, the predictions of future economic activity in this report are based on current socioeconomic trends and the current level of technology, which are likely to change in the long term. Estimates include all future section 7 impacts on specific land uses or activities within those areas proposed as critical habitat for the kangaroo rat, including certain protections also offered by the listing of the species. For example, estimates include technical assistance efforts, section 7 consultations, and project modifications that are likely to occur due to the listing regardless of whether critical habitat is designated. Thus, the economic costs in Exhibit ES-1 are indicators of the economic impacts associated with the designation of critical habitat as well as impacts related to the listing.
11. The total cost of \$12.5 million to \$63.3 million in Exhibit ES-1 represents the total costs that the Service, Federal action agencies and private applicants are likely to bear over the next ten years associated with the designation of critical habitat and the listing. Between 85 and 89 percent of these costs are driven by the economic costs of informal, formal and significant project modifications. The remainder of the costs are driven by technical assistance efforts, kangaroo rat surveys, and the administrative effort required to complete formal and informal section 7 consultations and re-initiations.

Exhibit ES-1					
SECTION 7 IMPACTS ASSOCIATED WITH THE LISTING AND DESIGNATION OF CRITICAL HABITAT FOR THE KANGAROO RAT (TEN YEARS)					
Critical Habitat Impact	Scenario	Costs to the Service	Costs to the Action Agency	Costs to the Applicant	Total Costs
Technical Assistance Call	Low	\$13,000	\$0	\$7,000	\$21,000
	High	\$21,000	\$0	\$88,000	\$109,000
Presence/absence Survey	Low	\$0	\$0	\$596,000	\$596,000
	High	\$0	\$78,000	\$1,946,000	\$2,024,000
Informal Consultations and Non-substantive Re-initiations	Low	\$131,000	\$171,000	\$289,000	\$591,000
	High	\$663,000	\$876,000	\$1,475,000	\$3,014,000
Formal Consultation and Substantive Re-initiations	Low	\$136,000	\$180,000	\$302,000	\$618,000
	High	\$428,000	\$435,000	\$691,000	\$1,553,000
Informal Project Modifications	Low	\$0	\$0	\$2,209,000	\$2,209,000
	High	\$0	\$0	\$13,803,000	\$13,803,000
Formal Consultation and Substantive Re-initiations Project Modifications	Low	\$0	\$0	\$7,833,000	\$7,833,000
	High	\$0	\$0	\$28,587,000	\$28,587,000
Significant Project Modifications	Low	\$0	\$0	\$657,000	\$657,000
	High	\$0	\$0	\$14,251,000	\$14,251,000
Total Costs	Low	\$280,000	\$351,000	\$11,893,000	\$12,525,000
	High	\$1,112,000	\$1,389,000	\$60,841,000	\$63,341,000
Source: Based on GIS analyses and estimates of local zoning and planning designations as well as information provided by land owners and managers potentially affected by the proposed critical habitat designation.					

12. Exhibit ES-2 provides an estimate of the total economic costs associated with the designation of critical habitat alone over the next ten years. This calculation is done in order to inform the Service which of the economic impacts are potentially avoidable by making changes in the proposed critical habitat designation, and which impacts are unavoidable because they are due to the listing. The critical habitat and listing impacts are separated by determining: 1) which portions of the proposed designation provide new information about the species range to Federal agencies; and 2) how critical habitat increases the probability that a Federal agency will consult with the Service on a project.

Exhibit ES-2 ECONOMIC COSTS ASSOCIATED WITH THE DESIGNATION OF CRITICAL HABITAT INDEPENDENT OF LISTING EFFECTS (TEN YEARS)*					
Critical Habitat Units	Scenario	Costs to the Service	Costs to the Action Agency	Costs to the Applicant	Total Costs
Unit 1	Low	\$10,000	\$13,000	\$409,000	\$433,000
	High	\$65,000	\$81,000	\$3,417,000	\$3,564,000
Unit 2	Low	\$20,000	\$25,000	\$806,000	\$850,000
	High	\$115,000	\$143,000	\$6,122,000	\$6,379,000
Unit 3	Low	\$4,000	\$5,000	\$156,000	\$164,000
	High	\$30,000	\$37,000	\$1,644,000	\$1,711,000
Unit 4	Low	\$5,000	\$6,000	\$207,000	\$218,000
	High	\$41,000	\$51,000	\$2,231,000	\$2,322,000
Unit 5	Low	\$0	\$0	\$10,000	\$10,000
	High	\$2,000	\$3,000	\$114,000	\$119,000
Unit 6	Low	\$11,000	\$14,000	\$484,000	\$510,000
	High	\$52,000	\$64,000	\$2,834,000	\$2,950,000
Total	Low	\$50,000	\$63,000	\$2,072,000	\$2,185,000
	High	\$305,000	\$379,000	\$16,362,000	\$17,045,000
*Note: The costs associated with substantive and non-substantive re-initiations were assumed to occur in Units 1 and 2 because majority of the past section 7 consultations were conducted in reference to projects within these two units. Source: Based on GIS analyses and estimates of local zoning and planning designation as well as information provided by land owners and managers potentially affected by the proposed critical habitat designation.					

13. As presented above in Exhibit ES-2, the estimated total costs associated with the designation of critical habitat above and beyond the costs associated with the listing of the species is between \$2.2 million and \$17 million over the next ten years. These costs arise from technical assistance efforts, kangaroo rat presence/absence surveys, section 7 consultations, and project modifications that are not likely to occur absent the proposed critical habitat designation. The estimates presented in ES-2 are likely to overstate the true costs of the designation because a portion of the project modification costs are likely to already be necessary to comply with the listing of other endangered species in the area, Army Corps of Engineers laws and regulations, and the California Environmental Quality Act. That is, a portion of these costs may be unavoidable even if an area is removed from critical habitat due to other laws and regulations in the area.

14. In addition to the direct costs associated outlined in ES-2, the designation of critical habitat may increase the costs associated with complying with other State and local regulations. These consequences are not intended by the Federal regulators (i.e., not the purpose of the designation or considered in developing the designation); however, they are real costs that may result from the designation. Specifically, this analysis estimates that critical habitat is likely to increase the level of effort required by project managers to comply with the California Environmental Quality Act. These costs are estimated to be between \$2.2 and \$11.2 million.
15. Based on the information provided in ES-1, ES-2, and the CEQA costs, the total costs of the listing and critical habitat within the proposed boundaries of the critical habitat designation are summarized below in Exhibit ES-3.

Exhibit ES-3		
COMBINED COSTS OF KANGAROO RAT LISTING, CRITICAL HABITAT, AND CEQA WITHIN PROPOSED CRITICAL HABITAT DESIGNATION (TEN YEARS)		
Total Costs Including Listing Effects		
Costs associated with section 7	Low	\$12,525,000
	High	\$63,341,000
CEQA costs	Low	\$2,200,000
	High	\$11,200,000
Total critical habitat costs	Low	\$14,725,000
	High	\$74,541,000
Total Costs Independent of Listing Effects		
Costs associated with section 7	Low	\$2,185,000
	High	\$17,045,000
CEQA costs	Low	\$2,200,000
	High	\$11,200,000
Total critical habitat costs	Low	\$4,385,000
	High	\$28,245,000
Source: GIS analyses and estimates of local zoning and planning designation as well as information provided by land owners and managers potentially affected by the proposed critical habitat designation.		

INTRODUCTION AND BACKGROUND

SECTION 1

16. In December 2000, the U.S. Fish and Wildlife Service (Service) proposed designating critical habitat for the San Bernardino kangaroo rat (*Dipodomys merriami parvus*) on approximately 55,400 acres in San Bernardino and Riverside counties, California. The purpose of this report is to identify and analyze potential economic impacts that could result from the proposed critical habitat designation. This report was prepared by Industrial Economics, Incorporated (IEc), under contract to the Service's Division of Economics.
17. Section 4(b)(2) of the Endangered Species Act (Act) requires the Service to base designation of critical habitat upon the best scientific and commercial data available, after taking into consideration the economic impact, and any other relevant impact, of specifying any particular area as critical habitat. The Service may exclude areas from critical habitat designation when the benefits of exclusion outweigh the benefits of including the areas within critical habitat, provided the exclusion will not result in extinction of the species.
18. Under the listing of a species, section 7(a)(2) of the Act requires Federal agencies to consult with the Service in order to ensure that activities they fund, authorize, permit, or carry out are not likely to jeopardize the continued existence of the species. The Act defines jeopardy as any action that would appreciably reduce the likelihood of both the survival and recovery of the species. For designated critical habitat, section 7(a)(2) also requires Federal agencies to consult with the Service to ensure that activities they fund, authorize, permit, or carry out do not result in destruction or adverse modification of critical habitat. Adverse modification of critical habitat is defined as any direct or indirect alteration that appreciably diminishes the value of critical habitat for the conservation of the species.
19. This analysis identifies potential section 7-related impacts that will occur in the critical habitat area over the next ten years and distinguishes between the economic impacts caused by the listing of the San Bernardino kangaroo rat and those effects caused by the proposed critical habitat designation. To evaluate the increment of economic impacts attributable to the critical habitat designation for the San Bernardino kangaroo rat (hereafter "kangaroo rat"), the analysis evaluates a "without critical

habitat" scenario and compares it to a "with critical habitat" scenario. The difference between the two is a measure of the net change in economic activity that may result solely from the designation of critical habitat for the kangaroo rat. In the event that a land use or activity would be limited or prohibited by another existing statute, regulation, or policy, the economic impacts associated with those limitations or prohibitions are identified, but would not be attributable to critical habitat designation.

20. The critical habitat designation for the kangaroo rat encompasses land under Tribal, private, State and Federal ownership, with Federal lands including lands managed by the U.S. Forest Service, Bureau of Land Management, and Department of Defense. This analysis assesses how implementation of section 7 of the Act for the kangaroo rat may affect current and planned land uses and activities in the proposed critical habitat designation over the next ten years. For non-Federal lands, section 7 consultations and resulting modifications to land uses and activities can only be required when a Federal nexus, or connection, exists. A Federal nexus arises if the activity or land use of concern involves Federal permits, Federal funding, or another form of Federal involvement. Section 7 consultations are not required for activities on State, county, Tribal, and private land that do not involve a Federal nexus.
21. This report estimates impacts of critical habitat designation on activities that are "reasonably foreseeable," including, but not limited to, activities which are currently authorized, permitted, or funded, or for which proposed plans are currently available to the public. In addition, this analysis uses socioeconomic projections from other research, such as the California Urban and Biodiversity Analysis (CURBA) model, as indicators of potential future activities. For purposes of near-term forecasting, these indicators of future activities are likely to be reliable. However, small changes in current trends, plans, and projections may have large effects on long range predictions. Independent of these uncertainties, the endangered status of the kangaroo rat may change in the future (e.g. from endangered to recovered). A change in status may reduce the need for the critical habitat designation. Thus, in order to reduce uncertainty, this analysis bases estimates on activities that are likely to occur within a ten-year time horizon. Cost estimates beyond a ten-year time horizon are likely to be highly inaccurate since socioeconomic conditions may shift dramatically.

1.1 Description of Species and Habitat

22. The San Bernardino kangaroo rat is one of 19 recognized subspecies of Merriam's kangaroo rat, a widespread species distributed throughout arid regions of the western United States and northwestern Mexico.¹⁰ In coastal southern California, Merriam's Kangaroo rat is the only species of kangaroo rat with four toes on each of its hind feet. The San Bernardino kangaroo rat has a body

¹⁰ Information on the kangaroo rat and its habitat is taken from the U.S. Fish and Wildlife Service, *Proposed Designation of Critical Habitat for the San Bernardino kangaroo rat*, December 8, 2000 (65 FR 77177).

length of about 3.7 inches, and a tail length of about 5.5 inches. The body color is pale yellow with a heavy overwash of dusky brown. The tail stripes are medium to dark brown and the foot pads and tail hairs are dark brown. The San Bernardino kangaroo rat is considerably darker and smaller than either of the other two subspecies of Merriam's kangaroo rat that occur in southern California.

23. The San Bernardino kangaroo rat is found in isolated areas in the San Bernardino and San Jacinto valleys in southern California. Based on field surveys and research, the Service has identified physical and biological habitat features, referred to as primary constituent elements, that are essential for the conservation of the kangaroo rat. These primary constituent elements for the kangaroo rat include:

- C Dynamic geomorphological and hydrological processes typical of fluvial systems within the historical range of the animal, i.e., areas that are within active and historical flood regimes including river, creek, stream, and wash channels; alluvial fans; flood plains; flood-control berms and lands adjacent to them; flood plain benches and terraces; and historic braided channels;
- C Historical and current alluvial processes within the historical range of the animal;
- C Alluvial sage scrub and associated vegetation, such as coastal sage scrub and chamise chaparral. Common plant species include: scalebroom (*Lepidospartum squamatum*), California buckwheat (*Eriogonum fasciculatum*), yerba santa (*Eriodictyon* spp.), our Lord's candle (*Yucca whipplei*), sugar bush (*Rhus ovata*), lemonadeberry (*Rhus integrifolia*), laurel sumac (*Malosma laurina*), California juniper (*Juniperus californicus*), mulefat (*Baccharis salicifolia*), showy penstemon (*Penstemon spectabilis*), golden aster (*Heterotheca villosa*), tall buckwheat (*Eriogonum elongatum*), prickly pear and cholla (*Opuntia* spp.), chamise (*Adenostoma fasciculatum*), popcorn flower (*Plagiobothrys* spp.), and native and nonnative grasses;
- C Sand, loam, or sandy loam soils within the historical range of the animal;
- C Upland areas that may provide refugia from environmental or demographic stochastic (i.e., random) and catastrophic events; and,

- C Moderate to low degree of human disturbance to habitat within the species' historical range, i.e., lands within or immediately adjacent to flood plain terraces that have suitable habitat for the species and areas within 50 m (150 ft) of currently suitable San Bernardino kangaroo rat habitat, such as agricultural lands that are not disced annually, out-of-production vineyards, margins of orchards, areas of active or inactive industrial or resource extraction activities, and urban/wildland interfaces.

1.2 Proposed Critical Habitat

24. The proposed critical habitat designation includes alluvial fans, historic braided channels, flood plains, washes and adjacent upland areas along the Santa Ana River (including City, Plunge, and San Timoteo Creeks), Lytle and Cajon Creeks, San Jacinto River and Bautista Creek, Etiwanda alluvial fan, Reche Canyon, and Jurupa Hills. All of the areas designated as critical habitat are within the geographical area currently known to be occupied by the kangaroo rat. The proposed critical habitat designation includes some existing features and structures, such as buildings, roads, railroads, airports, other paved areas, lawns, and other urban landscaped areas that do not support primary constituent elements for the kangaroo rat. The Service maintains that Federal actions limited to these areas would not require a section 7 consultation unless they may affect the species and/or primary constituent elements in/or adjacent to critical habitat. In summary, the critical habitat areas constitute the Service's best assessment of the areas that are essential for the conservation of the species.
25. Exhibit 1-1 shows the approximate acreage figures of land owned or managed by Federal and non-Federal entities within the proposed critical habitat designation.

Exhibit 1-1 LAND OWNERSHIP AND MANAGEMENT OF PROPOSED CRITICAL HABITAT BY COUNTY*					
County	Federal** (Percent of total)	Local/State (Percent of total)	Private (Percent of total)	Tribal (Percent of total)	Total (Percent of total)
San Bernardino	3,710	-	41,241	-	44,951
Riverside	550	2	8,756	1,149	10,457
Total	4,260 (7.7%)	2 (0.0%)	49,997 (90.2%)	1,149 (2.1%)	55,408 (100.0%)
*All figures in acres. Percentage of total acreage is given in parenthesis. ** Federal lands include Bureau of Land Management, Department of Defense, and National Forest. Source: U.S. Fish and Wildlife Service, <i>Proposed Designation of Critical Habitat for the San Bernardino kangaroo rat</i> , December 8, 2000 (65 FR 77177).					

26. The proposed critical habitat designation overlaps with several cities and municipalities in San Bernardino and Riverside counties. Exhibit 1-2 displays the total number of acres of each city and Census Designated Place (CDP) included within each unit of the kangaroo rat critical habitat boundary.¹¹

¹¹CDPs are delineated for the decennial census as the statistical counterparts of incorporated places. CDPs are delineated to provide data for settled concentrations of population that are identifiable by name but are not legally incorporated under the laws of the state in which they are located.

Exhibit 1-2							
ACREAGE CONTAINED WITHIN THE SAN BERNARDINO KANGAROO RAT CRITICAL HABITAT ¹							
County/ City/ CDP	Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6	Total Acres
Bloomington ²	-	-	-	-	-	325.2	325.2
Colton	3.2	-	-	-	197.6	-	200.8
Fontana	-	2,797.3	-	1,543.9	-	2,071.0	6,412.2
Glen Avon ²	-	-	-	-	-	21.9	21.9
Highland	2,666.3	-	-	-	-	-	2,666.3
Loma Linda	28.2	-	-	-	5.2	-	33.4
Mentone ²	191.5	-	-	-	-	-	191.5
Muscoy ²	-	781.2	-	-	-	-	781.2
Ontario	-	-	-	141.7	-	-	141.7
Rancho Cucamonga	-	-	-	3,261.4	-	-	3,261.4
Redlands	4,583.8	-	-	-	-	-	4,583.8
Rialto	-	1,184.8	-	-	-	-	1,184.8
San Bernardino	2,002.5	4,992.8	-	-	6.3	-	7,001.6
San Jacinto	-	-	973.5	-	-	-	973.5
Sunnyslope ²	-	-	-	-	-	20.3	20.3
Valle Vista ²	-	-	620.2	-	-	-	620.2
Yucaipa	29.3	-	-	-	-	-	29.3
Remaining areas of Riverside County	-	-	8,507.6	-	-	306.5	8,814.1
Remaining areas of San Bernardino County	2,568.4	10,865.2	-	4,555.3	109.7	42.2	18,140.8
Totals	12,073.2	20,621.3	10,101.3	9,502.3	318.8	2,787.1	55,404.0
¹ All figures are in acres. ² These names denote Census Designated Places (CDPs). Source: Census Designated Places as of January 1, 2000, U.S. Bureau of the Census, 2000 Tiger GIS files. Accessed from http://www.geographynetwork.com/data/tiger2000/ on April 2, 2001.							

27. A more detailed description of each critical habitat unit is provided below:

- Unit 1: Santa Ana River** - Critical habitat in this unit includes the Santa Ana River and portions of City, Plunge, Mill, and San Timoteo creeks. Bounded by the Seven Oaks Dam to the northeast, the area includes San Bernardino National Forest lands and portions of the cities of Colton, Highland, Loma Linda, Redlands, San Bernardino and Yucaipa. While the majority of the unit

is under non-Federal ownership, it includes areas managed by the United States Forest Service (USFS), Bureau of Land Management (BLM), and the Department of Defense (DoD). Unit 1 supports a variety of commercial and recreational land uses, including, but not limited to, gravel mining, golfing, citrus agriculture, housing, and industrial uses.

- **Unit 2: Lytle and Cajon Creeks** - Critical habitat in this unit contains habitat along and between the Lyle and Cajon creeks from the point that the creeks emanate from canyons within the San Bernardino National Forest to flood control channels downstream. Portions of the land contained within Unit 2 are also contained within the cities of Fontana, Rialto, and San Bernardino. The land in Unit 2 is primarily undeveloped and supports mining activities, the Glen Helen Regional Park, and limited commercial and residential development.
- **Unit 3: San Jacinto River-Bautista Creek** - Unit 3 contains approximately 10,104 acres within Riverside county, and includes portions of San Bernardino National Forest, Soboba Indian Reservation, Bautista Creek, and areas along the San Jacinto River in the vicinity of the cities of San Jacinto, Hemet and Valle Vista. Unit 3 also contains a small portion of land managed by the BLM. Land in this unit is used for pasture, off-road vehicle use, golf courses, sand mining, and urban development.
- **Unit 4: Etiwanda Alluvial Fan and Wash** - Unit 4 contains the active hydrological channels of Deer, Day, Etiwanda, and San Sevaine creeks. Small portions of the land are managed by the BLM and USFS, and the unit also contains portions of the cities of Fontana, Ontario, and Rancho Cucamonga. The northern portions of this unit are largely undeveloped but the southern portions contain land zoned for light and heavy industrial use.
- C **Unit 5: Reche Canyon**- This unit encompasses approximately 320 acres in and around Reche Canyon in San Bernardino County. A large portion of this unit is contained within the City of Colton, but the unit also contains small portions of the cities of Loma Linda and San Bernardino. All of this unit is privately owned and portions are developed for residential occupation. This unit contains Montecito Memorial Park, a large landscaped cemetery.
- C **Unit 6: Jurupa Hills- South Bloomington**- Unit 6 encompasses approximately 2,788 acres, either privately held or managed by municipal entities. The unit includes the Jurupa Hills and areas eastward to and including the south portion of the City of Bloomington. A majority of this unit is contained within the City of Fontana. This unit is contained primarily within

San Bernardino County, but a small portion of the unit is contained within Riverside County. Portions of the land are currently being developed for private residences.

1.3 Framework for Analysis

28. As noted above, this economic analysis identifies the impacts to specific land uses or activities within those areas proposed as critical habitat for the kangaroo rat. Impacts include future effects associated with the listing of the species, as well as any effect of the designation above and beyond those impacts associated with listing. The listing of the species is the most significant aspect of species protection, as it provides the majority of protections by making it illegal for any person to "take" a listed species. Take is defined by the Act to mean harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt to engage in any such conduct.
29. To quantify the increment of economic impacts attributable to the critical habitat designation for the kangaroo rat, beyond economic impacts of listing, the analysis evaluates a "without critical habitat" scenario and compares it to a "with critical habitat" scenario. The "without critical habitat" baseline for analysis represents current and expected economic activity under all modifications prior to critical habitat designation, including protections already accorded the kangaroo rat under Federal and State laws, such as the California Environmental Quality Act (CEQA). The difference between the two scenarios measures the net change in economic activity attributable to the designation of critical habitat for the kangaroo rat.

1.4 Methodological Approach

30. This report relies on a sequential methodology and focuses on distilling the salient and relevant aspects of potential economic impacts of designation. The methodology consists of:
- Determining the current and projected economic activity and development pressures within and around the proposed critical habitat area;
 - Considering what current and future activities that take place or will take place on the Federal, State, Tribal, local, and private land affected by critical habitat designation;
 - Identifying whether activities taking place on the State, Tribal, local, and private land are likely to involve a Federal nexus;

- Evaluating the likelihood that identified Federal actions and Federal nexuses will result in consultations and, in turn, that consultations will result in modifications to projects;
- C Attributing costs to any expected section 7-related consultations, project modifications and other economic impacts associated with the designation of critical habitat and the listing of the species;
- Determining which of these expected future economic costs would have happened due to the baseline regulations in the "without critical habitat scenario", and which will be triggered due to the designation of critical habitat;
- C Assessing whether critical habitat designation will create costs for small businesses as a result of modifications or delays to projects; and
- C Determining economic costs associated with public perceptions about the effect of critical habitat on the private land subject to designation.

1.5 Information Sources

31. The primary sources of information for this report were communications with personnel from the Service and affected Federal, State, Tribal, and local agencies, as well as publicly available data (e.g., databases available on the Internet). In addition, Geographic Information Systems (GIS) data were provided by the Service; University of California at Berkeley, Institute of Urban and Regional Development; California Department of Water Resources, Division of Planning and Local Assistance; California Department of Conservation, Farmland Mapping and Monitoring Program; U.S. Department of Commerce, Bureau of the Census; and various local planning departments.

RELEVANT BASELINE INFORMATION

SECTION 2

32. This section discusses the socioeconomic characteristics of regions proposed as critical habitat for the kangaroo rat. In addition, this section provides relevant information about regulations and requirements that exist in the baseline (i.e., the "without critical habitat" scenario) that are likely to impact the regional economy.

2.1 Socioeconomic Profile of the Critical Habitat Areas

33. To provide context for the discussion of potential economic impacts due to the proposed critical habitat designation, this section summarizes key economic and demographic information for the two counties containing proposed critical habitat for the kangaroo rat. County level data are provided to convey the nature of the regional economy. However, the critical habitat designation covers approximately 0.35 percent of San Bernardino County, and 0.22 percent of Riverside County; thus, county level data may not accurately reflect the socioeconomic characteristics of the critical habitat area.¹² Therefore, when available, data from cities, ZIP code areas, census tracts and census block, are used to provide a more accurate socioeconomic profile of the critical habitat areas.

2.1.1 Population

34. San Bernardino and Riverside counties are two of the fastest growing counties in California. Between 1990 and 2000, Riverside County grew by almost 375,000 people, adding 32 percent of its 1990 population. During this time period, it was the fourth fastest growing county in the state. San Bernardino County grew by over 290,000 people, or 21 percent of its 1990 population. San Bernardino was the 14th fastest growing county in the state.

¹²U.S. Department of Commerce, Bureau of the Census, "County 2000", TIGER/Line Files, Redistricting Census 2000, Washington DC, 2001. GIS data accessed at <http://www.geographynetwork.com/data/tiger2000/> on April 9, 2001.

35. Exhibit 2-1 shows the population growth over the past ten years for each city and county that contains land within the proposed critical habitat designation. For reference, the total critical habitat acreage contained within each city and county also is included in Exhibit 2-1.

Exhibit 2-1							
POPULATION GROWTH FOR CITIES AND COUNTIES CONTAINING KANGAROO RAT CRITICAL HABITAT							
County/ City	Acreage within Critical Habitat	1990 Population	2000 Population	Percent Growth, 1990 to 2000	Average Annual Growth, 1990 to 2000	Average Annual Growth, 1990 to 1995	Average Annual Growth, 1996 to 2000
California	55,404	29,758,213	34,336,091	15.4%	1.4%	1.4%	1.5%
Riverside County	10,450	1,170,413	1,522,855	30.1%	2.7%	3.0%	2.4%
San Jacinto city	974	16,210	26,124	61.2%	5.0%	7.9%	2.1%
Riverside County Unincorporated	9,477	385,384	401,362	4.1%	0.4%	-0.4%	1.3%
San Bernardino County	44,954	1,418,380	1,689,281	19.1%	1.8%	2.1%	1.4%
Colton city	201	40,273	47,333	17.5%	1.6%	1.9%	1.4%
Fontana city	6,412	87,535	117,395	34.1%	3.0%	3.2%	2.8%
Highland city	2,666	34,439	44,469	29.1%	2.6%	2.8%	2.4%
Loma Linda city	33	18,470	22,299	20.7%	1.9%	2.6%	1.2%
Ontario city	142	133,179	151,488	13.7%	1.3%	1.2%	1.4%
Rancho Cucamonga city	3,261	101,409	125,585	23.8%	2.2%	2.5%	1.9%
Redlands city	4,584	60,395	67,771	12.2%	1.2%	1.6%	0.7%
Rialto city	1,185	72,395	83,666	15.6%	1.5%	1.8%	1.1%
San Bernardino city	7,002	164,676	186,351	13.2%	1.3%	1.9%	0.6%
Yucaipa city	29	32,819	39,838	21.4%	2.0%	2.5%	1.4%
San Bernardino County Unincorporated	19,439	322,557	292,348	-9.4%	-0.9%	-2.7%	1.0%
Source: Derived from State of California, Department of Finance, "City/County Population and Housing Estimates, 1991-2000, with 1990 Census Counts." Sacramento, California, May 2000. Accessed at: http://www.dof.ca.gov/html/Demograp/E-5text.htm on April 2001.							

36. The first two columns in Exhibit 2-1 show how many acres of each city and county are included in all of the units of the proposed critical habitat designation for the kangaroo rat. San Bernardino, Fontana, and Rancho Cucamonga contain the most critical habitat, while Yucaipa and Loma Linda contain lesser amounts. The acres listed next to the "Unincorporated" heading beneath each county show how many acres of critical habitat fall outside of the incorporated city boundaries.

The third and fourth columns of Exhibit 2-1 show the total population of the state, counties, and cities containing proposed critical habitat for the kangaroo rat.¹³ In both 1990 and 2000, San Bernardino, Ontario, and Fontana had the three largest populations. The fifth column shows the percent change in population from 1990 to 2000. Based on percent growth, Fontana, San Jacinto and Highland were the three fastest growing cities that contain critical habitat. In general, the cities that contain critical habitat are growing faster than the state population (the weighted average of each of the critical habitat cities growth rates is 19.8 percent, which is significantly higher than the growth rate for the entire state of 13.8 percent).

37. Exhibit 2-1 presents estimates of the average annual percent growth rates for several periods between 1990 and 2000. These figures are calculated by determining the annual rate of growth in population for each city and county. These annual rates are then averaged to get the average rate for a five or ten-year period. For example, column six shows that San Jacinto's population grew at an average rate of five percent per year between 1990 and 2000, while Ontario only grew at an average of less than 1.3 percent per year. Only three out of the 11 cities that contain critical habitat grew at an average annual rate that was less than the entire state's rate of 1.4 percent per annum. The seventh and eighth columns of Exhibit 2-1 gives the average annual growth rate of each city and county between 1990 and 1995, and between 1996 and 2000, respectively. These figures show that all of the cities grew faster in the first half of the decade than the second half of the decade. California and the unincorporated areas of the San Bernardino and Riverside counties exhibit the opposite trend by growing faster in the second half of the decade. This implies that the high rates of growth in the urban areas in the early 1990s maybe be declining, while growth in the unincorporated areas is increasing. In general, the areas within and around the proposed critical habitat designation are developing at a relatively rapid pace.

2.1.2 Housing Units

38. Population growth is often linked to increases in the number of housing units built in a region. Exhibit 2-2 provides estimates of housing unit growth for each city and county that contains land within the proposed critical habitat designation.

¹³The benchmark for these population figures is the 1990 U.S. Census of Population and Housing figures. The California State Department of Finance adjusts the U.S. Census figures using independently estimated controls. For more information on this process, see the California State Department of Finance website at <http://www.dof.ca.gov/html/Demograp/E-5text.htm>.

Exhibit 2-2

**HOUSING UNIT GROWTH FOR CITIES AND COUNTIES CONTAINING
KANGAROO RAT CRITICAL HABITAT**

County/ City	Acreage within Critical Habitat	1990 Housing Units	2000 Housing Units	Percent Growth, 1990 to 2000	Average Annual Growth, 1990 to 2000	Average Annual Growth, 1990 to 1995	Average Annual Growth, 1996 to 2000
California	55,404	11,182,513	12,242,576	9.5%	0.9%	1.0%	0.8%
Riverside County	10,450	483,847	582,419	20.4%	1.9%	2.2%	1.6%
San Jacinto city	974	6,845	9,471	38.4%	3.3%	5.3%	1.3%
Unincorporated	9,477	161,357	155,310	-3.7%	-0.4%	-1.3%	0.5%
San Bernardino County	44,954	542,332	610,317	12.5%	1.2%	1.5%	0.9%
Colton city	201	14,787	15,911	7.6%	0.7%	0.6%	0.9%
Fontana city	6,412	29,383	36,504	24.2%	2.2%	2.1%	2.3%
Highland city	2,666	12,562	15,043	19.8%	1.8%	1.8%	1.8%
Loma Linda city	33	7,049	8,208	16.4%	1.5%	2.4%	0.7%
Ontario city	142	42,536	45,758	7.6%	0.7%	0.7%	0.7%
Rancho Cucamonga city	3,261	36,367	42,065	15.7%	1.5%	1.6%	1.3%
Redlands city	4,584	23,190	24,727	6.6%	0.7%	1.1%	0.2%
Rialto city	1,185	23,839	26,327	10.4%	1.0%	1.4%	0.6%
San Bernardino city	7,002	58,969	64,376	9.2%	0.9%	1.6%	0.1%
Yucaipa city	29	14,274	15,595	9.3%	0.9%	0.9%	0.9%
Unincorporated	19,439	147,989	132,620	-10.4%	-1.0%	-2.5%	0.5%

Source: Derived from State of California, Department of Finance, "City/County Population and Housing Estimates, 1991-2000, with 1990 Census Counts." Sacramento, California, May 2000. Accessed at: <http://www.dof.ca.gov/html/Demograp/E-5text.htm> on April 2001.

39. Not surprisingly, the growth and distribution of housing units over the last decade follows many of the same patterns as the population growth and distribution as displayed in Exhibit 2-1. San Jacinto, Fontana, and Highland are the three fastest growing cities both in terms of housing units and population. The number of housing units in the cities that contain critical habitat are growing at a weighted average rate of 12.5 percent, which is slightly higher than the state average of 9.5 percent.

40. The average annual growth in housing units is calculated in the same as the average annual growth in population described above. Similar to population, most of the cities had higher growth rates in the first half of the decade as compared to the second half of the decade. The unincorporated

areas in both counties had higher growth rates in the second half of the decade.

2.1.3 Economic Activity

41. The proposed designation of critical habitat for the kangaroo rat lies within the vicinity of several major centers of industrial and commercial economic activity. Understanding the types of businesses that operate within and around critical habitat may help to explain the current activities which occur in the proposed designation and future development pressure on the region.
42. The U.S. Census Bureau maintains a ZIP Code Business Patterns database based on the five-year economic census and several other data sources. This database provides information on all business establishments. Establishments are organized by industry based on Standard Industrial Classification (SIC) designations and by location based on ZIP codes. The most recent data provided by the Census Bureau include the establishments that employed one or more employees during the middle of March 1997.
43. The ArcView 3.0 Geographic Information System (GIS) software package was used to determine which ZIP codes overlap with the proposed designation of critical habitat for the kangaroo rat. The proposed designation was found to intersect with 33 separate ZIP code areas. The ZIP code areas generally cover much larger areas than the areas covered by the critical habitat designation. Thus, based on a review of critical habitat and ZIP code area maps, ZIP code areas with little overlap with critical habitat areas were excluded.¹⁴ Thus, economic statistics from 23 ZIP code areas are shown in Exhibit 2-3.

¹⁴For example, the 91761 ZIP code area was excluded because it contains a relatively small amount of critical habitat, and it covers a large area of the City of Ontario that is not included within the proposed critical habitat designation.

Exhibit 2-3						
ECONOMIC ACTIVITY IN AND AROUND PROPOSED CRITICAL HABITAT DESIGNATION						
	Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6
Critical Habitat Acres	12,073	20,623	10,101	9,501	319	2,787
ZIP Code Area Acres	100,307	205,069	330,189	96,474	21,466	35,654
Percent of ZIP Areas in Critical Habitat	12%	10%	3%	10%	1%	8%
Total Establishments (1997)	2,844	665	1,162	3,047	715	1,214
Average Establishment Density (Establishments per 100 ZIP code area acres)	2.84	0.32	0.35	3.16	3.33	3.40
Agricultural Services, Forestry, and Fishing	39	17	34	26	8	27
Mining	4	1	1	1	1	4
Construction	216	95	183	212	63	202
Manufacturing	132	49	56	379	58	145
Transportation and Public Utilities	107	41	40	185	42	110
Wholesale Trade	150	33	42	346	67	114
Retail Trade	734	149	268	675	177	226
Finance, Insurance, and Real Estate	283	34	86	263	63	42
Services	1152	235	441	932	228	331
Unclassified Establishments	27	11	11	28	8	13
Source: "U.S. ZIP Code Areas," GIS shape file, Environmental Systems Research Institute (ESRI), Redlands, CA, 1999 Economic data derived from U.S. Census Bureau, ZIP Code Business Patterns, 1997 Economic Census. Accessed at http://tier2.census.gov/zbp/index.html on April 4, 2001.						

44. The first row in Exhibit 2-3 details the number of acres in each unit of the proposed critical habitat designation for the kangaroo rat. The second row details the combined acres of the ZIP code areas for all of the ZIP code areas that contain more than 250 acres of critical habitat. For example, Unit 6 of the critical habitat designation overlaps with three ZIP code areas. The combined acreage of these three ZIP code areas is 35,654 acres. The third row in Exhibit 2-3 compares the acreage in the critical habitat units with the acreage in the overlapping ZIP code areas. These percentages show that each critical habitat unit is considerably smaller than the area covered by the ZIP code areas. Thus, the economic statistic for the ZIP code areas provides a picture of the economic activity within and around each critical habitat unit.

45. The "Total Establishments (1997)" row shows the total number of physical locations at which business is conducted or services or industrial operations are performed with one or more paid employee in 1997. The area around Unit 4 contains the highest number of establishments, while the

area around Unit 5 contains the least. The next row gives the average number of establishments per 100 acres of the ZIP code area. These figures provide a measure of the average density of commercial and industrial establishments in the region. Unit 6 falls within the area with the highest average density of economic establishments, while the area within and around Unit 2 contains the lowest average density.

46. The next ten rows in Exhibit 2-3 break down the number of establishments by Standard Industrial Classification industry type. In general, most of the establishments are services and retail trade businesses, which is common for this type of urban and suburban region. Mining and agricultural services, forestry and fishing are the least represented. Exhibit 2-4 provides a method of comparing the economic activity within the ZIP codes areas and between critical habitat units by breaking down the establishment industry type in percentage terms. The weighted average for all units is also provided for comparison.

Exhibit 2-4							
PERCENT OF TOTAL ESTABLISHMENTS BY INDUSTRY							
	Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6	Total for all Units
Total Establishments (1997)	2,844	665	1,162	3,047	715	1,214	9,647
Agricultural Services, Forestry, and Fishing	1.4%	2.6%	2.9%	0.9%	1.1%	2.2%	1.6%
Mining	0.1%	0.2%	0.1%	0.0%	0.1%	0.3%	0.1%
Construction	7.6%	14.3%	15.7%	7.0%	8.8%	16.6%	10.1%
Manufacturing	4.6%	7.4%	4.8%	12.4%	8.1%	11.9%	8.5%
Transportation and Public Utilities	3.8%	6.2%	3.4%	6.1%	5.9%	9.1%	5.4%
Wholesale Trade	5.3%	5.0%	3.6%	11.4%	9.4%	9.4%	7.8%
Retail Trade	25.8%	22.4%	23.1%	22.2%	24.8%	18.6%	23.1%
Finance, Insurance, and Real Estate	10.0%	5.1%	7.4%	8.6%	8.8%	3.5%	8.0%
Services	40.5%	35.3%	38.0%	30.6%	31.9%	27.3%	34.4%
Unclassified Establishments	0.9%	1.7%	0.9%	0.9%	1.1%	1.1%	1.0%
Source: Data derived from U.S. Census Bureau, ZIP Code Business Patterns, 1997 Economic Census. Accessed at http://tier2.census.gov/zbp/index.html on April 4, 2001.							

47. Exhibit 2-4 shows the number of establishments in each industry in percentage terms. The last row entitled "Total for All Units" is a weighted average of the establishments for areas within and around all of the critical habitat units. Based on these average percentage figures, services, retail trade and construction are the industries with the most establishments in this region. Exhibit 2-4 also shows the relative number of establishments by critical habitat unit. Compared to the other units, Unit 3 has a relatively high number of agricultural services, forestry and fishing establishments, Unit 6 has a relatively high number of construction establishments, and Unit 4 has a relatively high number of manufacturing establishments.

2.1.4 Urban Growth

48. Growth in population, housing units, and economic activity often results in the conversion of land from agricultural uses, open space or wildlands to urbanized and built-up land. Increases in urbanized land have important implications for kangaroo rat habitat and survival because urbanized land often does not provide the primary constituent elements critical for the species' survival. The region within and around the proposed critical habitat for the kangaroo rat has seen significant increases in the number of acres of urbanized land in the recent past. The Service identifies urban growth and development as one of the activities threatening the kangaroo rat in the final rule listing the species as endangered.
49. The Farmland Mapping and Monitoring Program (FMMP) uses aerial photographs, a computer mapping system, public review, and field reconnaissance to document changes in land use in California on a biennial basis beginning in 1982. Exhibit 2-5 was derived from the FMMP report provided on their website. It tracks the changes in the number of acres of urbanized and built-up land in San Bernardino and Riverside counties since 1982. The FMMP defines urbanized and built-up land as land occupied by structures with a building density of at least one unit every 1.5 acres. The land is used for residential, industrial and commercial construction; institutional and public administration; railroad and other transportation yards; cemeteries; airports; golf courses; sanitary landfills; sewage treatment; water control structures; and other developed purposes.

Exhibit 2-5

URBANIZED LAND IN SAN BERNARDINO AND RIVERSIDE COUNTIES

	1984	1986	1988	1990	1992	1994	1996	1998	14 year Average
Riverside Urbanized Land (acres)	163,746	173,363	188,169	207,189	217,260	225,476	231,987	240,888	206,010
Biennial Increase (acres)	n/a	9,617	14,807	19,020	10,071	8,216	6,511	8,901	11,020
Average Annual Percentage Increase	n/a	2.89%	4.18%	4.93%	2.40%	1.87%	1.43%	1.90%	2.80%
San Bernardino Urbanized Land (acres)	169,344	187,666	197,917	210,426	222,564	227,249	232,605	234,980	210,344
Biennial Increase (acres)	n/a	18,322	10,251	12,509	12,138	4,685	5,356	2,375	9,377
Average Annual Percentage Increase	n/a	5.27%	2.69%	3.11%	2.84%	1.05%	1.17%	0.51%	2.38%

Source: Farmland Mapping and Monitoring Program, GIS database files, State of California, Department of Conservation, Division of Land Resource Protection, 2001. Data accessed from <http://www.consrv.ca.gov/dlrp/FMMP/index/htm> on April 10, 2001.

50. The first and fourth rows in Exhibit 2-5 show the acres of urbanized and built-up land as defined by the FMMP for Riverside and San Bernardino counties. These figures show that the amount of urbanized land has been steadily growing between 1984 and 1998. San Bernardino County had slightly more urbanized land in 1984 than Riverside, but Riverside grew slightly faster and had more urbanized land in 1998. The second and fifth columns of the exhibit show the amount of land urbanized during each two year period. The largest numeric growth in urban land in San Bernardino County came between 1984 and 1986, while the largest growth for Riverside County came between 1988 and 1990. The last column in the exhibit gives an average of the 14 year time period. This column shows that the average biennial growth for Riverside was slightly higher than San Bernardino. The third and sixth rows show the average annual percentage increase for each two year period. In San Bernardino, annual urban growth percentages started high at over 5 percent per year, but then slowly decreased to one half of one percent in 1998. Riverside growth rates peaked around 1990, but also decreased in the remainder of the decade. While the rate of urban growth is high in this region, it appears that the rate of growth is slowing. Whether this trend will continue in the future depends on population growth, housing units growth, economic activity and development projections for the region.

2.2 Socioeconomic Projections for the Critical Habitat Areas

51. In order to study the impacts of the designation of critical habitat for a species, it is important to determine what the population growth, economic activity, and urban growth is likely to be in the baseline, i.e., "without critical habitat" scenario.

2.2.1 Population Growth Projections

52. Population growth projections are important for this analysis because they indicate how much development and urban growth will likely occur within the region. Unlike the historical population estimates in the previous section, population projections are only calculated by county in California. Exhibit 2-6 summarizes the projected population growth from 1990 to 2040 for San Bernardino and Riverside counties. Population projections for the State of California are also included for reference.

Exhibit 2-6						
POPULATION PROJECTIONS BY COUNTY						
County	1990 Population ¹	2000 Population, Projected	2010 Population, Projected	2020 Population, Projected	2030 Population, Projected	2040 Population, Projected
California	29,942,397	34,653,395	39,957,616	45,448,627	51,868,655	58,731,006
Percent Growth	n/a	16%	15%	14%	14%	13%
Average Annual Percent Growth	n/a	1.5%	1.4%	1.3%	1.3%	1.3%
Riverside	1,194,623	1,570,885	2,125,537	2,773,431	3,553,281	4,446,277
Percent Growth	n/a	31%	35%	30%	28%	25%
Average Annual Percent Growth	n/a	2.8%	3.1%	2.7%	2.5%	2.3%
San Bernardino	1,436,696	1,727,452	2,187,807	2,747,213	3,425,554	4,202,152
Percent Growth	n/a	20%	27%	26%	25%	23%
Average Annual Percent Growth	n/a	1.9%	2.4%	2.3%	2.2%	2.1%
Source: State of California, Department of Finance, "County Population Projections with Race/Ethnic Detail." Sacramento, California, December 1998. Accessed at http://www.dof.ca.gov/html/Demograp/Proj_race.htm on April 3, 2001						
¹ Note: 1990 Population figures differ slightly from those in Exhibit 2-1 because the California State population estimates are slightly different than the 2000 Census Bureau population estimates.						

53. Exhibit 2-6 indicates that both Riverside and San Bernardino counties are projected to undergo significant population growth over the next fifty years. Riverside's population is expected to double by 2020 and nearly triple by 2030. San Bernardino is expected to nearly double by 2020 and triple by 2040. In contrast, the state is expected to grow at a slower rate, not quite doubling by 2040. The relative growth rates can be also be determined by comparing the percent growth for each county and the state. For example, between 2000 and 2010, Riverside's population is expected to grow by 35 percent and San Bernardino is expected to grow by 27 percent, while the entire state is expected to grow 15 percent. Growth rates are projected to decrease for both counties and the state after 2010, but the county growth rates remain consistently higher than the state growth rates in each period. This indicates that the counties that contain critical habitat are projected to continue to grow faster than the state as a whole.

2.2.2 Projected Economic Activity

54. The California State Economic Development Department compiles labor market information and develops predictions for the number of jobs by industry and by county several years into the future. Employment projections often imply which industries are predicted to grow, and which industries will become stagnant. Projections for future economic activities are important for this analysis because some industries may be affected by the proposed designation of critical habitat for the kangaroo rat. Exhibit 2-7 summarizes the employment figures for 1997 and projected figures for 2004 by industry for San Bernardino and Riverside counties.

Exhibit 2-7				
EMPLOYMENT PROJECTIONS BY INDUSTRY				
Occupation	1997 Annual Employment	2004 Annual Employment	Absolute Change	Percentage Change
Riverside Total, All Occupations	371,000	463,500	92,500	24.9%
Managers and Administrators Occupations	21,110	26,450	5,340	25.3%
Professional, Paraprofessional, Technical Occupations	68,630	86,690	18,060	26.3%
Sales and Related Occupations	46,240	55,930	9,690	21.0%
Clerical & Administrative Support Occupations	57,640	68,320	10,680	18.5%
Service Occupations	72,990	87,580	14,590	20.0%
Agricultural, Forestry, Fishing Occupations	7,470	9,920	2,450	32.8%
Production, Construction, Operating, Maintenance, Material Handling	96,900	128,590	31,690	32.7%
San Bernardino Total, All Occupations	470,490	569,590	99,100	21.1%
Managers and Administrators Occupations	25,840	31,170	5,330	20.6%
Professional, Paraprofessional, Technical	94,220	115,770	21,550	22.9%
Sales and Related Occupations	59,380	67,850	8,470	14.3%
Clerical & Administrative Support Occupations	77,200	88,480	11,280	14.6%
Service Occupations	77,070	90,020	12,950	16.8%
Agricultural, Forestry, Fishing Occupations	5,870	7,630	1,760	30.0%
Production, Construction, Operating, Maintenance, Material Handling Workers	130,900	168,660	37,760	28.8%
Source: "Occupational Employment Projections, 1997-2004" Employment Development Department, Sacramento, CA. Accessed at http://www.calmis.ca.gov/htmlfile/county.htm on April 19, 2001.				

55. The first row of Exhibit 2-7 shows that the number of average annual jobs in Riverside is expected to increase by 92,500 between 1997 and 2004. This represents almost a 25 percent increase from the 1997 employment levels. The next six rows show that the industries with the most employment in 1997 and projected employment in 2004 are production, construction, operating, maintenance, material handling, service occupations, and professional, paraprofessional, technical occupations.¹⁵ The fourth column shows which industries will gain the most jobs by 2004, and the

¹⁵Note: The industry figures in Exhibit 2-7 do not necessarily correspond with the industry figures in the historical economic activity figure above, Exhibit 2-4. This is because 1) Exhibit 2-7 is based on employment statistics instead of the number of establishments, and 2) the industry categories in the Exhibit 2-7 are derived from the Occupational Employment Statistics (OES) survey, not the 1987 SIC codes.

fifth column shows the percentage increase from 1997. "Production, Construction, etc.", is the industry category with the highest absolute growth, but agriculture, forestry, fishing occupations will have the highest percentage growth.

56. The San Bernardino County figures are similar to the economic projections for Riverside County. Employment in San Bernardino County is expected to increase by almost 100,000 by 2004, or a 21.1 percent increase from 1997 levels. Production, construction, operating, maintenance, material handling, and professional, paraprofessional, technical occupations are the largest industries in both 1997 and 2004, and are expected have the largest absolute change by 2004. Similar to Riverside County, agriculture, forestry, and fishing occupations are expected to have the largest percentage change during the seven year period.

2.2.3 Projected Development Pressure

57. Population growth and increased economic activity in an area generally lead to the conversion of land from open space or agriculture to urbanized or developed land. This trend is important for this economic analysis because the designation of critical habitat may impact how and where this urban growth occurs. Thus, it is important to understand how and where urban development may occur in the baseline, i.e. without critical habitat scenario.
58. Researchers at the Institute of Urban and Regional Development and the University of California, Berkeley have developed a urban growth model called the California Urban and Biodiversity Analysis (CURBA) model. The CURBA model uses GIS technology to provide spatial predictions of the extent of urban growth in the year 2020. The model relies on the current location and type of farmland and urban development, slope and elevation data, location of roads and hydrographic features, wetlands and flood zones, proximity to jurisdictional boundaries, local growth policies, and recent population and job growth.¹⁶ The CURBA model defines urbanized land in the same way the FMMP defines urbanized land described above, i.e. land occupied by structures with a building density of at least 1 unit every 1.5 acres.
59. Using the GIS analysis tools, the proposed critical habitat designation boundaries were layered over two different estimations of urban growth in 2020. The first estimation assumes that urban growth will occur in the center of cities (infill) at a higher rate than observed historically. This represents a conservative measure of urban growth in which less land is converted to urban uses, or a "low" urban growth scenario. The other estimate of urban growth assumes current infill rates and densities. This predicts a larger extent of urban growth or a "high" urban growth scenario. The number of acres that are urbanized within the proposed critical habitat designation are presented

¹⁶John D. Landis, et al., "Development and Pilot Application of the California Urban and Biodiversity Analysis (CURBA) Model". Accessed at <http://www.esri.com/library/userconf/proc98/PROCEED/TO600/PAP571/P571.HTM> on May 7, 2001.

below in Exhibit 2-8.

Exhibit 2-8						
PROJECTED URBAN GROWTH WITHIN THE PROPOSED CRITICAL HABITAT DESIGNATION ¹						
	Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6
Total Land ²	12,082.7	20,638.5	10,109.4	9,507.9	319.0	2,789.4
1996 Urbanized land	1,910.2 [15.8%]	1,602.7 [7.8%]	524.1 [5.2%]	1,317.5 [13.9%]	170.5 [53.4%]	695.7 [24.9%]
Low Scenario:						
2020 Projected urbanized land	6,325.8 [52.4%]	11,215.1 [54.3%]	2,055.3 [20.3%]	6,303.1 [66.3%]	264.0 [82.8%]	1,745.7 [62.6%]
Increase in urbanized land	4,415.6 [36.5%]	9,612.4 [46.6%]	1,531.2 [15.1%]	4,985.6 [52.4%]	93.5 [29.3%]	1,050.0 [37.6%]
Implied 2010 increase in urbanized land	2,207.8 [18.3%]	4,806.2 [23.3%]	765.6 [7.6%]	2,492.8 [26.2%]	46.8 [14.7%]	525.0 [18.8%]
High Scenario:						
2020 Projected urbanized land	10,914.4 [90.3%]	19,543.6 [94.7%]	4,755.7 [47.0%]	9,469.0 [99.6%]	319.0 [100.0%]	2,789.4 [100.0%]
Increase in urbanized land	9,004.2 [74.5%]	17,940.9 [86.9%]	4,231.7 [41.9%]	8,151.4 [85.7%]	148.5 [46.6%]	2,093.7 [75.1%]
Implied 2010 increase in urbanized land	4,502.1 [37.3%]	8,970.5 [43.5%]	2,115.8 [20.9%]	4,075.7 [42.9%]	74.3 [23.3%]	1,046.8 [37.5%]
¹ Note: All figures in acres. Percentage of total land included within brackets.						
² Note: Total Unit acreage may differ slightly from the figures cited elsewhere in this report due to the different mapping units used in the GIS software.						
Sources: U.S. Fish and Wildlife Service, Digital Map layer of critical habitat area for the San Bernardino kangaroo rat, Carlsbad, CA 2001. Institute of Urban and Regional Development at University of California at Berkeley, 2020 Urban Footprint digital map layers, 2001.						

60. The numbers in Exhibit 2-8 were calculated using a state-wide urban growth model. This model does not attempt to predict how individual Federal, State, Tribal, county and city decision makers will attempt regulate and plan their growth in order to protect open space and natural resources. Therefore, these figures should be interpreted as an indication of development pressure, and not as a precise measure of where development will occur.
61. Exhibit 2-8 gives the total number of acres in each unit as well as the number of acres that were urbanized in 1996. In 1996, Units 1 and 2 contained the most urbanized acres, while Unit 5 had the highest percentage of urbanized acres when compared to the total number of acres in each unit. Exhibit 2-8 also provides the number of acres that the CURBA model predicts will be urbanized by the year 2020 based on low urban growth assumptions. The model predicts that Unit 2 will contain

the most urbanized land in 2020 while Unit 5 will be the most urbanized in percentage terms. The exhibit also shows how many urban acres will be added to each unit between 1996 and 2020. In the low scenario, these additional acres range from 93.5 to 9,612.4 acres, or from 15.1 percent to 52.4 percent of the total acreage in each unit. The "Implied 2010 increase in urban growth" figures are calculated by dividing the total increase in urbanized land by two.¹⁷

62. The high urban growth scenario of the CURBA model predicts much more urban growth within the proposed critical habitat designation. It predicts that over 90 percent of all of the units (except Unit 3) will be urbanized by 2020. All of Units 5 and 6 will be urbanized due to their proximity to major roads and urban areas. Unit 2 is predicted to have the largest increase in urbanized land in both acreage and percentage terms.
63. These urban growth predictions are helpful to provide an idea of where critical habitat may have economic impacts on the region. However, the predictions do not take into account other restrictions on development such as local zoning ordinances, habitat conservation plans (HCP), CEQA, etc. In addition, the CURBA model only predicts the extent of urban growth, not the character. The type of projects that people will undertake will make a significant difference in whether or not critical habitat will have economic impacts in this region. Therefore, the next two sections of this report will analyze the current and future restrictions on development and the types of activities that are likely to occur within and around the proposed critical habitat designation.

2.3 Baseline Regulations

64. This section provides relevant information about the regulatory elements that exist in the baseline, i.e., the "without critical habitat" scenario. These regulations limit or encourage the development potential discussed above, affect the section 7 consultation process, and/or trigger consultations without the designation of critical habitat.

2.3.1 Listing

65. In January 1998, under a provision of the Act, the Service emergency-listed the kangaroo rat as an endangered species. Under the listing, Federal agencies must consult with the Service regarding any actions they fund, authorize, permit, or carry out that may affect a listed species. The listing of the kangaroo rat is the most significant aspect of baseline protection, as it provides the most protections since it makes it illegal for any person to "take" a listed species, which is defined by the Act to mean harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt to engage in any such conduct. This analysis seeks to recognize those impacts or potential modifications to activities above and beyond those attributable to the listing of the kangaroo rat.

¹⁷This method assumes that the rate of urban growth will be relatively constant over the 24 year time period.

2.3.2 Overlap with Other Listed Species

66. Generally, if a consultation is triggered for any listed species, the consultation process will also take into account all other federally listed species known or thought to occupy areas on or near the project lands. The Carlsbad Fish and Wildlife Office has conducted formal consultations on the kangaroo rat in combination with several species, including the federally-listed coastal California gnatcatcher, Santa Ana River woolly-star, and the slender-horned spineflower.
67. The net effect of the presence of other federally listed species in the proposed critical habitat areas for the kangaroo rat is that the number of consultations conducted for the kangaroo rat alone is likely be smaller than would be expected in the absence of these species. Indeed, past consultations on the kangaroo rat involve an average of two to three species per consultation. Thus, the cost of a consultation that involves the kangaroo rat may not be fully attributable to the presence of this species or its habitat. Nonetheless, because consultations must consider each listed species separately, a certain amount of research and time will be spent on the kangaroo rat regardless of the presence of other species. In order to present a conservative estimate of the economic impacts associated with the listing and the proposed designation of critical habitat, this analysis assumes that all future section 7 consultations within the extant boundaries of the proposed critical habitat are fully attributable to the presence of the kangaroo rat and its habitat.

2.3.3 California Natural Community Conservation Planning Act

68. Under the California Natural Community Conservation Planning Act (NCCP), the California Resources Agency began implementing a pilot program in 1991 for the protection of coastal sage scrub habitat. The primary goal of this program is "to conserve natural communities and accommodate compatible land use." The program organizes five counties in southern California, including San Bernardino and Riverside counties, into 11 planning "subregions," which are further divided into "subareas." Each subregion and subarea must design its own habitat conservation plan for endangered species, which is submitted to the Service as a Habitat Conservation Plan (HCP) under the Act. If approved, these plans allow local communities to manage endangered species on specified reserve areas without having to seek additional section 10 take permits from the Service for those species covered by the HCP. The intention is to streamline the administrative efforts of affected parties.¹⁸
69. ***San Bernardino Valley MSHCP.*** A majority of the acreage in Units 1, 2, 4, 5 and 6 are contained within the San Bernardino subregional planning area of the NCCP region. San Bernardino County is currently spearheading the effort with 11 cities to develop the San Bernardino Valley-wide

¹⁸ "An Introduction to NCCP." Accessed at <http://www.ceres.ca.gov/CRA/NCCP/intro.htm>, on March 9, 2001.

Multiple Species Habitat Conservation Plan (MSHCP). The MSHCP will encompass an area of 309,000 acres and will include the kangaroo rat and its habitat in the planning process. According to an April 3, 2001, progress report to San Bernardino County Board of Supervisors, the plan may include a subarea plan for the Santa Ana River wash. The county anticipates issuing a draft of their MSHCP and Environmental Impact Report by winter 2002.¹⁹

70. The San Bernardino Valley MSHCP is likely to add more reserves for the kangaroo rat and regulate development in such a way as to increase the potential that the kangaroo rat and other endangered and threatened species will recover. Thus, if the San Bernardino Valley MSHCP is ultimately approved, the Service indicates that it will reassess any critical habitat boundaries in light of the HCP within the Service's listing and funding priorities.²⁰ However, because the MSHCP is currently in the planning stages and may not be implemented for another five to ten years, its effects are too speculative to be included in this analysis. In addition, the Service indicates that the MSHCP and HCPs in general may reduce the scope of specific consultations, but they are not likely to completely replace them.²¹
71. ***Western Riverside County MSHCP.*** The Western Riverside County MSHCP area has been included in the designation of critical habitat for the kangaroo rat because it has not yet been approved by the Service. Once approved, the plan will likely encompass almost all of the proposed kangaroo rat critical habitat areas that fall within Riverside County. While specifics of the plan are not yet complete, the plan is currently slated to address up to 164 species, and is likely to include 510,000 acres of conserve lands. The plan is proposing to include provisions for the kangaroo rat and its habitat when it is completed (planned for October 2002).²² If the plan is approved, activities within the plan area that affect kangaroo rat habitat may not require incidental take permits from the Service.

¹⁹"Report/Recommendation to the Board of Supervisors of San Bernardino County, CA and Record of Action" by Director, Land Use Services Department, April 3, 2001.

²⁰U.S. Fish and Wildlife Service, "Frequently Asked Questions about Critical Habitat Designation and the San Bernardino Kangaroo Rat." January 3, 2001.

²¹ IEc communication with Biologist, U.S. Fish and Wildlife Service, Carlsbad Fish and Wildlife Office, April 13, 2001. This assertion is supported by evidence from the San Diego MSCP. In Multiple Species Conservation Program (MSCP) areas, the Service presently makes recommendations for project modifications during a project's public notice period. For projects that may have large impacts on endangered species, the Service often attends meetings with Land Use Environment Group staff to discuss options, but such activities have remained informal.

²² *Preliminary Draft: Western Riverside County MSHCP, Alternatives Development Document*, County of Riverside Transportation and Land Management Agency, October 4, 2000. IEc communication with Staff, County of Riverside, Transportation and Land Management Agency, April 6, 2001.

However, actions by Federal agencies that may affect the kangaroo rat will still require consultation with the Service.²³ The Service expects that these consultations will remain informal if the proposed project falls within the scope of the plan.²⁴ Tribal lands that fall in critical habitat units and the MSHCP in Riverside County will not be subject to restrictions imposed by the MSHCP.

2.3.4 California Environmental Quality Act

72. The California Environmental Quality Act (CEQA) requires identification of environmental effects of proposed projects that have the potential to harm sensitive species (state or federally listed). The lead agency (typically the California State agency in charge of the oversight of a project) must determine whether a proposed project would have a "significant" effect on the environment. Under CEQA, surveys are conducted in order to determine the environmental effects of proposed projects on all rare, threatened and endangered species. Section 15065 of Article 5 of the CEQA regulations states that a finding of significance is mandatory if the project will "substantially reduce the habitat of a fish and wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of an endangered, rare or threatened species, or eliminate important examples of the major periods of California history or prehistory." If the lead agency finds a project may cause significant impacts, the landowners must prepare an Environmental Impact Report (EIR).²⁵

²³ This is evident from the Service consultation with U.S. Department of Transportation on State Route 125 which considered impacts on the California gnatcatcher, San Diego fairy shrimp, least Bell's vireo, and Otay tarplant even though these species are included in the San Diego MSCP. (February 1999)

²⁴ IEc communication with Biologist, U.S. Fish and Wildlife Service, Carlsbad Fish and Wildlife Office, April 13, 2001.

²⁵ California Resources Agency, "Summary and Overview of the California Environmental Quality Act", November 12, 1998, http://ceres.ca.gov/topic/env_law/ceqa/summary.html, August 23, 2000.

73. Any economic impacts identified by the EIR process are due to the presence of a particular species on the project land, whether or not it has been designated as critical habitat by the Service. Review of the CEQA statute and conversations with the California Resources Agency (one of the agencies responsible for administering CEQA) revealed that when a species is known to occupy a parcel of land, the designation of critical habitat alone does not require a lead agency to pursue any further actions.²⁶
74. In some cases, the requirements of the CEQA process may be similar to the requirements of the listing and critical habitat requirements. For example, a project manager may be required to conduct a survey or prepare a habitat analysis as part of the CEQA EIR process. The data supplied by these analyses may be useful in the section 7 consultation process associated with endangered species.²⁷ Therefore, the CEQA regulations may reduce the level of effort required by project managers to comply with the endangered species regulations.

2.3.5 Executive Orders on Tribal Lands

75. Unit 3 of the proposed critical habitat designation for the kangaroo rat contains approximately 1,149 acres of Soboba Tribal lands. Any consultations on this land will be conducted in accordance with Executive Order 13175, entitled *Consultation and Coordination with Indian Tribal Governments* (hereafter "Order") which was signed by President Clinton on November 6, 2000. This Order builds on the policies outlined in the Presidential Memorandum of April 29, 1994, entitled *Government-to-Government Relations with Native American Tribal Governments* (hereafter "Memorandum"). Both the Order and the Memorandum state that the executive departments and agencies shall work with federally recognized Tribes on a government-to-government basis. The Order enhances that discussion by stating that, for example:

- C The Federal Government shall grant Tribes the maximum administrative discretion possible;
- C Federal Agencies shall encourage Tribes to develop their own policies to achieve program objectives and, where possible, defer to Tribes to establish standards;
- C No Agency shall promulgate any regulation that has Tribal implications, that imposes substantial direct compliance costs on Tribal governments, and that is not required by statute, unless 1) the funds necessary to pay the direct costs incurred by the Tribe in complying with the regulation are provided by

²⁶ Personal communication with the California Resources Agency Office on September 11, 2000.

²⁷ Personal communication with Jones & Stokes Associates, Inc., on May 22, 2001.

the Federal Government, or 2) the agency a) consults with the Tribal officials early in the process of developing the regulation, b) provides a Tribal summary impact statement in the preamble of the regulation, and c) makes available to the Office of Management and Budget any written communications submitted to the Agency by the Tribal officials;

- C Agencies shall review and streamline the processes under which Tribes apply for waivers; and
- C Each Agency shall designate an official with the principal responsibility for the agency's implementation of the Order.

76. While the full effect of this Order will depend on its implementation over time, it appears that the net effect is likely to be a reduction in the potential for unfunded section 7 consultations, project modifications, and other impacts associated with the designation of critical habitat for the kangaroo rat on the Soboba Tribal lands.

2.3.6 Local Zoning Ordinances and General Plans

77. A majority of the proposed critical habitat designation for the kangaroo rat falls within local and county lands with zoning designations. These zoning designations range from "open space" which restricts almost all development to "proposed development" which encourages urban growth. These zoning ordinances will impact current and future development extent, location, and nature, and thus will impact which type of activities will occur within the critical habitat designation.

78. Zoning designations tend to change over time as cities extend their boundaries and local planning boards change their development concepts. Zoning may be changed over the next ten years to accommodate development and increasing population growth, or they may be changed to ensure dwindling open space and natural vegetation areas are preserved. It is difficult to predict how and where these changes will occur, thus this analysis relies on the current zoning designations as the most accurate predictor of future designations. Whenever possible, local general plans are used instead of zoning ordinances because they provide a more accurate picture of the city's future predicted growth. Since each city and county uses different zoning methods, the baseline impacts of zoning designations will be discussed as they effect each unit in the Section 3.

CRITICAL HABITAT IMPACTS

SECTION 3

79. The previous two sections introduced the geographic areas where the Service is proposing to designate critical habitat for the kangaroo rat; the socioeconomic profile of these areas; general predictions of population, economic and urban growth; and relevant regulations that affect the section 7 consultation process and development in the region. This section will identify the current land use activities within the proposed critical habitat designation as well as the location, nature, and extent of future activities that may be affected by critical habitat. Section 4 will assign incremental cost estimates to these activities.
80. This section begins with a general description of land uses and potential Federal nexuses for all 55,404 acres of the proposed designation for the kangaroo rat. Following these descriptions, the impacts of the critical habitat designation on each of the six critical habitat units are discussed. Each unit-specific section is further broken down into land owner and manager sub-sections. Each sub-section begins with a description of the uses for the land within critical habitat and the land owner or manager's influence. The land use descriptions are provided for reference and are not directly used in the cost calculations. A discussion of the planning efforts, zoning designations, or other regulations that are likely to influence future development and activities within critical habitat follows. This information is augmented by a brief description of any project that is currently planned that will likely have a Federal nexus.
81. The fact that a specific parcel of land is zoned or planned for development does not necessarily mean that it will be developed over the next ten years. Actual development may be closely related to population growth, economic climate, and the proximity to roads and city centers. Therefore, this analysis reconciles the amount of land that is *planned* for development with the amount of land that is *projected* to be developed by the CURBA model. This reconciliation results in an estimate of the type, location, and extent of future development, called "likely urban development." The following conditions are used to reconcile planned and projected development acreage figures:

- C **If Projected acres are greater than Planned acres:** When the amount of acres that is projected to be developed is greater than the amount of acres

that is planned to be developed, this analysis assumes that local land owners and managers will restrict development to these areas currently planned for growth. This assumption is supported by the fact that many of the areas that are not zoned for urban growth are flood zones. Therefore, the acreage figures for planned growth are used as the "likely urban development" figures.

- C **If Planned acres are greater than Projected acres:** When the number of acres planned for urban growth is greater than the amount of land projected to be urbanized by 2010, this analysis assumes that only the amount of land projected for urban growth will be developed. This assumption is made because some communities have developed plans that are designed to accommodate urban growth for the next 20 years or more. Therefore, the amount of land planned for urban growth is not likely to be fully developed over the next ten years. In this scenario, the projected urban growth figures are used as the "likely urban development" figures.

82. In some cases, portions of the planned urban area are already developed. Exhibit 2-8 shows that approximately 6,200 acres of the entire proposed critical habitat area was developed as of 1996. Based on detailed aerial photos, and in order to present conservative (i.e., high) estimates of the amount of development that could potentially be impacted by critical habitat, this analysis assumes that almost all of the current urban development could support additional future development. For example, a 100-acre area in Unit 4 may currently be considered urban because it meets the minimum density of one dwelling unit every 1.5 acres. However, this analysis assumes that this area has the potential to develop further, and thus there may be projects on this land that could require a section 7 consultation. Unit 5 is an exception because over half of its area is currently developed with dense residential communities. This area is excluded from the estimate of projected future growth.
83. Following the six unit-specific sections, this analysis describes activities that are projected to occur in all or almost all of the critical habitat units, such as flood control activities and road maintenance. Each of these sections include a quantitative summary of the number of current and future activities that are likely to have a Federal nexus within the critical habitat designation.
84. The final portion of Section 3 contains a summary of all of the likely urban development and potential future projects that may be consulted on over the next ten years. These figures are used in Section 4 to determine the total number of section 7 consultations and other impacts within the critical habitat area, as well as the costs associated with these impacts.

3.1 General Land Use Within Proposed Critical Habitat Designation

85. In order to estimate the future economic impact of the designation of critical habitat for the kangaroo rat, it is important to determine the nature and extent of current land use in the region. The following exhibit presents the land use data based on a GIS analysis of the California Department of Water Resources 1993 Upper Santa Ana River Land Use Survey.²⁸ The land use classifications presented in Exhibit 3-1 are taken directly from the Department of Water Resources survey. A brief description of each land use classification is presented in Appendix A.
86. Exhibit 3-1 provides a detailed look at the types of activities that occurred within the extant boundaries of the designated critical habitat units in 1993. Based on review of aerial maps and conversations with land owners and managers, current land use in these areas is very similar to 1993 patterns, although the number of acres dedicated to each land use may have changed somewhat. For example, the Service indicates that many of the vineyards that were active in 1993 in Unit 4 are no longer operational. In general, the figures presented in Exhibit 3-1 are an accurate indication of current land uses within each unit. More recent land use information provided by the various land owners and managers are included in the unit-specific sections below.
87. The "Urbanized land" classification indicates that in all, only 15.4 percent of the proposed critical habitat designation has been developed for urban uses. Exhibit 3-1 also shows that Unit 3 contains a large proportion of agricultural land in the form of citrus and sub-tropical fruits and general crop lands. On average, 76.2 percent of the land designated as critical habitat for the kangaroo rat is native vegetation or open land. This is consistent with the Service personnel's intent to exclude urban and built-up lands from the proposed designation and to include the remaining portions of viable habitat for the kangaroo rat.

²⁸The 1993 study is the most recent land use data available in GIS format.

Exhibit 3-1**GENERAL LAND USE IN 1993 IN KANGAROO RAT CRITICAL HABITAT AREAS**

Land Use Category*	Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6	Total	Per-centage
Urbanized Land	2,975.0	2,286.6	675.8	1,832.5	80.1	685.8	8,535.8	15.4%
Residential	432.0	562.9	301.1	410.4	68.3	400.3	2,175.1	3.9%
Commercial	29.1	117.4	29.8	121.5	4.1	-	301.8	0.5%
Industrial	554.0	778.2	104.3	439.2	-	56.1	1,931.9	3.5%
Urban Landscape	116.9	213.4	82.9	12.2	-	32.6	458.0	0.8%
Vacant	1,843.0	614.7	157.8	849.1	7.6	196.8	3,669.0	6.6%
Agricultural Land	634.0	222.9	2,421.7	1,219.5	-	164.6	4,662.7	8.4%
Citrus and Sub-tropical	521.2	39.8	999.1	14.4	-	1.7	1,576.3	2.8%
Crops	66.0	15.5	967.5	26.2	-	30.3	1,105.6	2.0%
Idle	-	-	73.8	0.3	-	-	74.1	0.1%
Pasture	12.8	82.2	306.3	-	-	-	401.3	0.7%
Vineyards	-	-	-	1,170.1	-	124.8	1,294.9	2.3%
Semi-agricultural	34.0	85.3	75.0	8.5	-	7.8	210.6	0.4%
Habitat and Open Land	8,464.1	18,111.7	7,003.8	6,450.2	238.7	1,936.9	42,205.5	76.2%
Barren and Wasteland	2,017.5	2,865.6	1,408.1	-	-	-	6,291.3	11.4%
Vegetation	6,446.0	15,228.6	4,881.4	6,394.6	238.7	1,936.9	35,126.2	63.4%
Water Surface	0.6	17.5	714.3	55.7	-	-	788.1	1.4%
Total	12,073.1	20,621.3	10,101.3	9,502.2	318.8	2,787.2	55,404.0	100%

* Note: See Appendix A for a general description of the land use categories.

Source: GIS analysis of California Department of Water Resources Land Use Data, 1993 Upper Santa Ana River Land Use Survey.

88. A few cities and local agencies have prepared long range master plans or general plans that indicate the type of development and/or construction that will occur in the long term. However, the majority of the land owners and managers in the critical habitat region do not have specific plans beyond a five or ten-year time horizon. For land owners and managers that do not plan up to ten years in the future, this analysis estimates future land use and development activities based on historic trends and one and two-year plans. Predictions beyond ten years become highly speculative and are unable to account for a large number of exogenous factors such as technology change and shifts in regional and national socioeconomic trends. For example, due to a technological advance, water conservation districts could shift from using water spreading basins to a more efficient form of ground water recharge, such as pumping excess water flows directly underground. This could greatly reduce the need for water recharge basins in the region over the next ten years. Therefore, due to uncertainty regarding future technological and economic changes, the planning horizons of many of the land owner and managers in the region, and for the reasons discussed in Section 1, a ten-year time horizon is used throughout this section.

3.2 Potential Federal Nexuses within Critical Habitat

89. The most common Federal nexus or connection within the proposed designation of critical habitat is issuance of 404 permits under the Clean Water Act by the U.S. Army Corps of Engineers (ACOE). A section 404 permit is required for all activities that may affect or are adjacent to the jurisdictional waters of the United States. The identification of jurisdictional waters is generally done by consultants according to ACOE definitions and regulations on a case by case basis, since water flows change over time. Permits are generally not required if a project impacts less than one tenth of an acre of jurisdictional waters.²⁹ The proposed critical habitat designation includes many active and dry creek and stream beds, thus many of the larger private and public activities within critical habitat could require ACOE permits.
90. Federal nexuses also exist whenever a Federal agency conducts an activity or allows an activity to be conducted on the land it manages or owns. Approximately ten percent of the proposed critical habitat designation is owned or managed by the Federal government, so this nexus is likely to arise for a portion of the activities taking place within the proposed critical habitat.

²⁹Personal communication with Ecologist, U.S. Army Corps of Engineers, Seven Oaks Dams Resident Office, on May 10, 2001.

91. Other Federal nexuses may occur for activities that required licencing or oversight from the Federal Communication Commission or the Federal Aviation Administration. In addition, a nexus may exist for activities that are funded in full or in part by the U.S. Environmental Protection Agency (EPA), the Department of Energy, the Federal Highway Administration, the Federal Emergency Management Agency, Bureau of Indian Affairs, or any other Federal agency. Specific activities and the associated Federal nexuses are identified in the remainder of this section.

3.3 Impacts of Critical Habitat Designation on Unit 1

92. As discussed in Section 2, between 2,200 and 4,500 acres of Unit 1 (18 to 37 percent of the entire unit) are projected to be converted into urbanized land in the next ten years. In addition, mining, flood control, water conservation and construction activities on two airports are currently taking place and will likely continue in the future in this area. The following section attempts to identify where developments in Unit 1 will take place, as well as the specific activities in the area that may affect the proposed critical habitat for the kangaroo rat.

3.3.1 Bureau of Land Management (BLM)

93. The 1,040 acres of land within Unit 1 that fall under BLM jurisdiction are either protected as part of the Santa Ana River wash or are mined for sand and gravel. All 1,040 acres are considered to have a Federal nexus because it is under the jurisdiction of a Federal agency. Approximately 80 percent of the area is undeveloped and will remain so as part of flood control measures. The other 20 percent is leased for mining. Personnel at BLM do not foresee any changes in management practices due to the proposed designation of critical habitat for the kangaroo rat. The listing of this species and other species on BLM lands has not generated any consultations or changed existing practices. BLM personnel anticipate a potential section 7 consultation with the Service regarding the renewal of the permit for a gun club that exists on these BLM lands.³⁰ The mining activities and flood control activities on BLM land are likely to be impacted by the Land Management and HCP for the Upper Santa Ana River Wash. These activities are discussed in further detail in the Santa Ana River Wash section below.

3.3.2 San Bernardino International Airport Authority

94. The San Bernardino International Airport Authority (SBIAA) is a Joint Powers Authority (JPA) consisting of representatives from the County of San Bernardino and the cities of San Bernardino, Colton, Loma Linda, and Highland. The SBIAA was formed in 1992 in order to redevelop land that until 1994 comprised Norton Air Force Base. As such, the SBIAA is working to develop the roughly 2,100 acre property into a commercial airport and trade center. The property

³⁰Personal communication with a Planner, Bureau of Land Management, May 2, 2001.

also includes an 18-hole golf course. The entire property has a Federal nexus as it falls under the Federal Aviation Administration's (FAA) jurisdiction.

95. The SBIAA is currently involved in a section 7 consultation between the Service and the Department of Defense (DOD) regarding the transfer of the former Norton Air Force Base to the San Bernardino International Airport and Trade Center (SBIATC). The SBIAA has retained consultants and legal support in order to conduct this consultation as well as to address issues regarding the proposed critical habitat designation.³¹ The SBIAA estimates that it has spent approximately \$20,000 per year on the legal and consultant fees associated with the current DOD consultation and the critical habitat designation to date, and that these fees are likely to increase next year. The ongoing DOD consultation is likely to involve a conference regarding the proposed critical habitat designation for the kangaroo rat.³² The Service indicates that once this DOD consultation/conference is complete, additional consultations should not be needed for future operation, construction, or maintenance projects because they will avoid any additional impacts to listed species and critical habitat. Nonetheless, this analysis assumes that one future SBIAA project that was not considered in this DOD consultation/conference may require a separate consultation over the next ten years.
96. In addition to the DOD involvement, the SBIAA is currently in the final stages of applying for three grants from the FAA. They include a \$1.3 million grant for the construction of a hanger/terminal, a \$7 million grant for the construction of a JPA training facility, and a \$5 to \$20 million grant for the rehabilitation of the main runway. In addition, the SBIAA may apply for zero to two more unrelated grants over the next ten years. The FAA and the SBIAA consulted informally with the Service regarding the potential effects of the main runway project (\$5 to \$20 million) on two federally listed species, the Santa Ana Woolly-star and the kangaroo rat. During this informal consultation, the FAA and the SBIAA modified the proposed project to avoid impacts to the Santa Ana Woolly-star and the kangaroo rat. After these project modifications, the Service determined that the rehabilitation of the runway project was not likely to adversely affect federally listed species or proposed critical habitat for the kangaroo rat because the proposed actions avoid all direct effects to areas currently considered occupied, and would not alter any primary constituent elements of proposed critical habitat for kangaroo rat.³³ Additionally, the Service determined that the

³¹ IEc communication with the environmental consultant to the San Bernardino International Airport Authority, May 9, 2001.

³² A conference is similar to a section 7 consultation, however it is conducted in reference to a *proposed* designation of critical habitat or a *proposed* listing of a species.

³³ Letter from the Service to the Federal Aviation Administration regarding Concurrence With a Not Likely To Adversely Affect Determination for the Revised Proposed Action for the San Bernardino International Airport (formerly Norton Air Force Base) Runway Reconstruction and Safety Zone Improvements Project on August 23, 2001.

construction of the JPA training facility (\$7 million) is not likely to adversely affect federally listed species or proposed critical habitat.³⁴ Finally, the area for the hanger/terminal project (\$1.3 million) is outside of proposed critical habitat, has been awarded, and is proceeding without the need to consult or conference.³⁵ Thus, the potential economic costs to the SBIAA and the region include: 1) costs associated with the delay of possible construction or rehabilitation projects for airport facilities in the future, and/or 2) the costs associated with the potential loss of future Federal grant money.³⁶ These types of economic costs are discussed and quantified in the "Significant Project Modifications and Delays" section in Section 4.

97. In summary, this analysis assumes that the SBIAA is likely to be involved in the following consultations with the Service in reference to projects within the proposed critical habitat boundaries:

- C One conference or consultation with the DOD regarding proposed critical habitat on the former Norton Air Force Base properties;
- C One future SBIAA project that was not considered in the DOD consultation/conference; and
- C Zero to two consultations for future grant applications on unrelated projects.

98. Therefore, this analysis assumes that in addition to the completed informal consultation on the runway rehabilitation project, the SBIAA is likely to be involved in two to four future consultations with the Service over the next ten years.

3.3.3 San Bernardino City

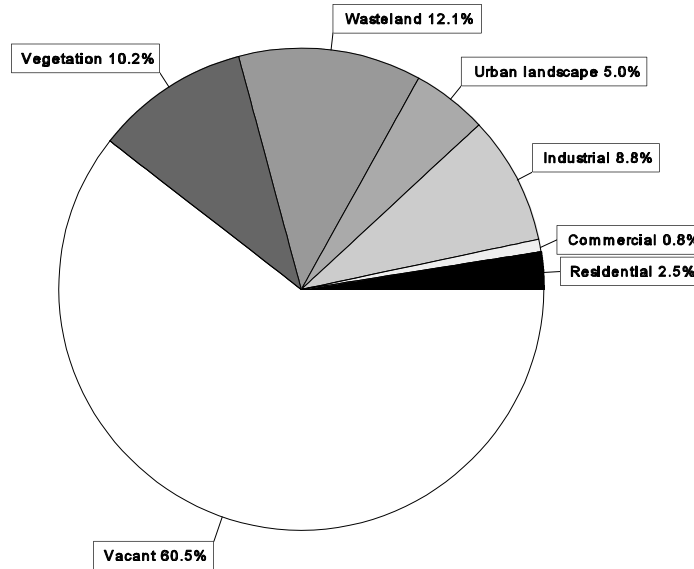
99. Approximately 2,000 acres of Unit 1 are contained within the incorporated areas of the City of San Bernardino. The following chart provides the general land data for this area:

³⁴Letter from the Service to Tetra Tech, Inc., regarding San Bernardino Regional Emergency Training Center Site, San Bernardino International Airport, formerly the U.S. Norton Air Force Base, San Bernardino County, California on August 3, 2001

³⁵Personal communication received by the Service on August 28, 2001, from Jim Imborski, of the Associated Engineers Inc.

³⁶ Personal communication with the Carlsbad Fish and Wildlife Office, San Bernardino International Airport Authority, Inland Valley Development Agency, July 11, 2001.

San Bernardino Land Use Within Unit 1



100. Almost all of the land contained within the City of San Bernardino and Unit 1 lies on the Norton Air Force Base and the portion of Unit 1 southwest of the base. This area is generally zoned for flood control for airport development. A very small portion of the unit adjacent to the I-10 and I-215 interchange is included within the city's Southeast Redevelopment Area. Critical habitat in this area overlaps with a small amount of land zoned for commercial and heavy industrial development.³⁷ There is also a small portion of Unit 1 that falls within the City of San Bernardino in the northern-most region of the unit. This region is zoned for suburban and low density residential development as well as for public flood control.

101. The City of San Bernardino currently has some specific plans for projects in the proposed critical habitat area that may have Federal nexuses. The Highland Hills housing development is currently planned to be constructed in the northern-most portion of Unit 1. The plans include the construction of a golf course along City Creek into the City of Highland.³⁸ Since this plan will likely impact jurisdictional waters of the U.S., a permit from the ACOE will likely be necessary. In addition, discharges from the joint Colton/City of San Bernardino Rapid Infiltration/Extraction

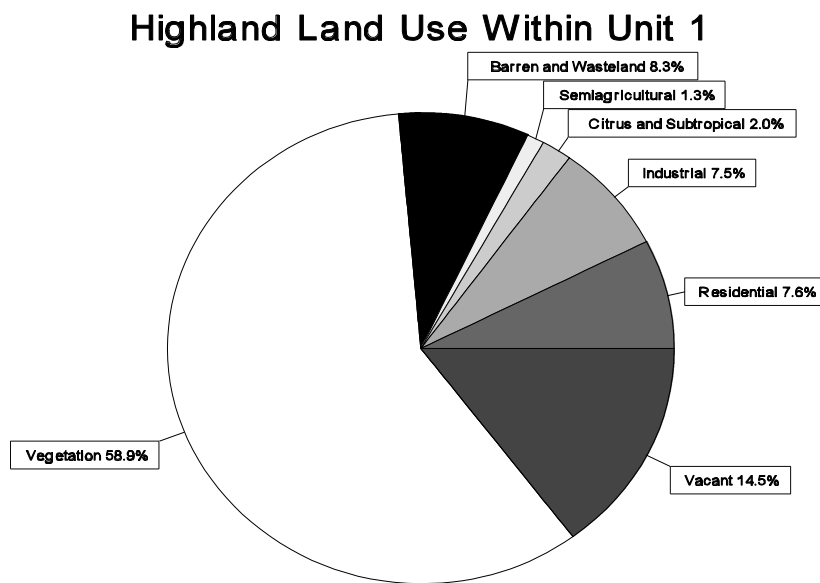
³⁷City of San Bernardino Economic Development Agency, "Redevelopment Project Areas." Accessed at http://www.sanbernardino-eda.org/pages/081-Red_Proj_Area_c.htm on May 10, 2001.

³⁸Personal communication with the Community Development Director, City of Highland on May 30, 2001.

(RIX) wastewater treatment plant may require new National Pollutant Discharge Elimination System (NPDES) permits.³⁹ Finally, the planned activities mentioned above on the San Bernardino International Airport land are within the incorporated areas of the City of San Bernardino and are likely to be affected by the critical habitat designation.

3.3.4 City of Highland

102. The City of Highland contains approximately 2,700 acres of Unit 1. The following chart provides land use data for this area:



103. The central northern portion of Unit 1 falls within the boundaries of the City of Highland. Along City Creek, the critical habitat area is zoned for open space. One area south of City Creek and on both sides of Boulder Avenue is zoned for planned development and commercial growth. All lands south of this area and south of Greenspot Road are zoned for open space or agriculture. Near the western border of the City of Highland and along the northern edge of Unit 1 some of the land is zoned for single family residential development.

104. The City of Highland is currently consulting with the Service regarding a widening project on 5th Street and an improvements project on Baseline Avenue. The city indicates that there currently are plans to build an elementary and middle school near Boulder Avenue within the

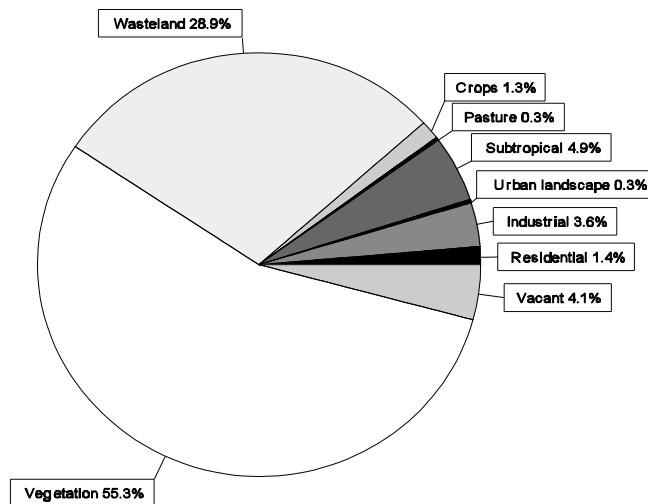
³⁹Letter from Best, Best & Krieger, May 23, 2001.

proposed critical habitat. There are also plans to construct a 12-acre commercial shopping center in the same region. A Federal nexus is not currently evident for these projects, but one may arise during the construction process. Mining activities are planned to proceed in the Santa Ana River wash area.⁴⁰ These activities will be discussed in detail below.

3.3.5 City of Redlands

105. Approximately 4,600 acres of Unit 1 are contained within the incorporated areas of the City of Redlands. The following chart provides the general land use data for this area:

Redlands Land Use Within Unit 1



106. A majority of the land contained within the city of Redlands and within Unit 1 is zoned for open land. This zoning designation provides for limited development of those areas of the City that are not suited for permanent occupancy or residence due to some specific characteristic of the land such as flooding, erosion, or fire hazard. Any structure built on the land must not cover more than five percent of the lot. A portion of the land in the southeast corner of Unit 1 is zoned for general industrial use. This zoning designation provides for and encourages the development of land for industrial purposes, to protect the district from inharmonious non-industrial uses and to promote neat, orderly, and uniform industrial development. Structures can cover up to 50 percent of the land

⁴⁰Personal communication with the Community Development Director, City of Highland on May 30, 2001.

in these lots (0.115 acres minimum size).⁴¹

107. The portion of Unit 1 that contains the San Timoteo Creek also contains some lands zoned by the City of Redlands, the City of Loma Linda, and San Bernardino County. All of these lands are zoned as an agricultural district.
108. The area designated as potential critical habitat in Redlands is comprised primarily of outwash and floodplain for the Santa Ana River. As such, it is protected from development and zoned as open space. There has been some surface mining in the floodplain since the 1960s. These operations include a large leased area, only part of which is actually mined. The only expansion of mining activities within the last five years has been deepening of existing pits. The City of Redlands has approved three plans to deepen pits recently and is currently considering another. The city does not consider these pits to be occupied by the kangaroo rat, and so it has not consulted with the Service.⁴² These mining activities are considered in further detail in the Santa Ana River Wash section below.
109. The City of Redlands is currently consulting with the Service regarding the construction of two bridge projects where Alabama Street and at Orange Street cross the Santa Ana River. The previous bridges were destroyed due to flooding. These projects receive some Federal funds and thus have a Federal nexus. The City is also considering constructing a sports complex near the critical habitat area. A 15-acre portion of the sports complex within the proposed critical habitat designation will serve as a detention basin for the storm drain system installed by Standard Pacific Homes. Construction and maintenance activities in this detention basin may require a consultation with the Service. In addition, Redlands currently operates the California Street Landfill in the area between California Street and Alabama Street south of the Santa Ana River. Operation and maintenance as well as a planned expansion of this facility may require consultations with the Service, although a Federal nexus is not evident at this time.⁴³ Potential consultations on these activities are considered in the road and flood control section below and the development activities in Exhibit 3-2.
110. In addition to these projects, the Public Works Department of the City of Redlands currently operates the Redlands Municipal Airport. Most of the airport is included within the proposed designation of critical habitat. Operation, maintenance, and construction activities on this airport are generally funded in part by the Federal Aviation Authority (FAA) and thus have a Federal nexus. Currently, the city is considering plans for runway maintenance and the construction of a

⁴¹ City of Redlands, Municipal Code, Section 18: Zoning Ordinance. Accessed at <http://www.ci.redlands.ca.us/40184.html> on May 9, 2001.

⁴²IEc communication with a Redlands city planner. May 8, 2001.

⁴³Letter from Best, Best & Krieger, LLP to IEc on May 24, 2001.

helicopter pad that will occur within critical habitat.⁴⁴ Based on this information, this analysis assumes activities on the Redlands Municipal Airport may lead to two to four consultations over the next ten years.

3.3.6 City of Yucaipa

111. Approximately 30 acres of the extreme southeast corner of Unit 1 is contained within the City of Yucaipa. All of this area is currently undeveloped with native vegetation and zoned as a planned development area.

3.3.7 City of Loma Linda

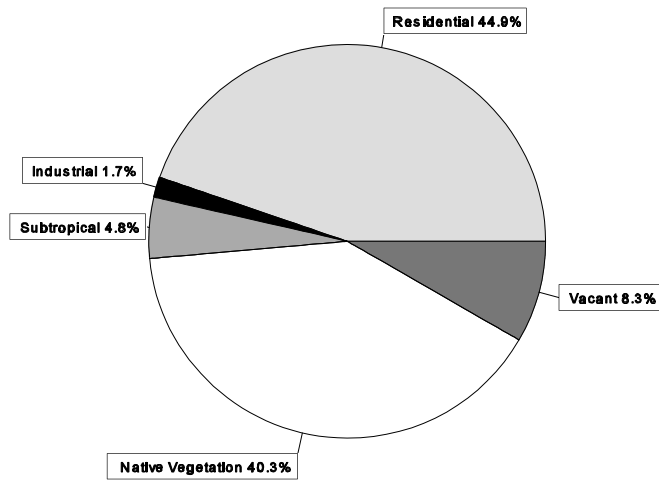
112. Less than 30 acres of the northern section of the San Timoteo portion of Unit 1 is contained within the incorporated area of the City of Loma Linda. Most of this land is currently vacant or used for citrus and subtropical agricultural uses. Most of this region is zoned as a planned community.

3.3.8 San Bernardino County

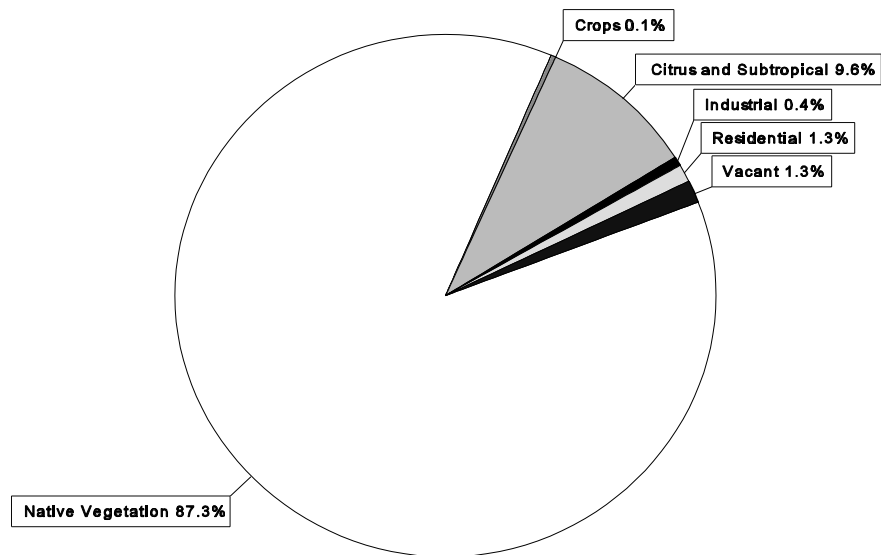
113. San Bernardino County manages approximately 2,600 acres of Unit 1 as well as approximately 190 acres of the Mentone CDP. The following charts provide the general land use data for this area:

⁴⁴Letter from Best, Best & Krieger, LLP to IEc on May 24, 2001.

Mentone Land Use Within Unit 1



San Bernardino County Land Use Within Unit 1



114. A majority of the San Bernardino County land contained within Unit 1 is not zoned, or zoning maps are not available. A small portion of the northern areas of the San Timoteo Canyon portion of Unit 1 is zoned for rural living. In addition, all of the land within the Mentone CDP is zoned for rural living.
115. Activities on the San Bernardino County land include mining, flood control, road maintenance, and water conservation.⁴⁵ Each of these activities are discussed in further detail in the Santa Ana Wash section and the road maintenance section below.

3.3.9 Santa Ana River Wash

116. The Santa Ana River Wash is an area of approximately 4,375 acres contained almost entirely within Unit 1. This includes areas zoned as open space by the cities of Highland and Redlands and some San Bernardino County lands, as well as land owned or managed by the Bureau of Land Management, various water conservation and flood control districts, two mining operations, and private landowners. The wash is currently used for extraction of construction materials, flood control activities, water conservation activities, the preservation of habitat, and the location for various utilities, transportation and water supply corridors. In order to accommodate all of these important functions, a Wash Committee composed of the various stakeholders began meeting in 1997. The Committee is in the initial phases of preparing an HCP as a subarea plan under the San Bernardino Valley MSHCP. While the first draft of this HCP has not been completed, it still serves as an indicator of the types of activities that currently occur in the Santa Ana Wash, as well as the extent and nature of future activities.⁴⁶
117. ***Aggregate Extraction and Processing.*** Cemex Inc. and Robertson's Ready Mix currently extract three to four million tons of aggregate annually on both leased and privately owned lands. These mining activities occur on approximately 720 acres of land fully permitted for mining, currently being mined or previously mined. Approximately 1,180 additional acres are owned or leased for potential future mining and processing within the wash area by the two mining companies. The conceptual plan discussed by the Santa Ana Wash stakeholders includes a reduction in the land owned or leased for potential future mining to approximately 500 acres. Since the HCP has not been developed, this 500 acres is a low estimate of the extent of future mining in Unit 1 and the 1,180 acres is a high estimate. Some of these lands are managed by the BLM and some of the activities will affect jurisdictional waters of the United States, therefore these activities are likely to have a Federal nexus.

⁴⁵Personal communication with Senior Associate Planner, San Bernardino County, on May 21, 2001.

⁴⁶Santa Ana River Wash Coordinated Planning Activities Committee, "Draft Proposed Land Management and Habitat Conservation Plan for the Upper Santa Ana River Wash," May 2000.

118. **Water Conservation and Water Supply Activities.** The water conservation and waste supply activities within Unit 1 are included in the "Water Supply and Conservation Activities" section below. The conceptual plan for the draft HCP calls for approximately 775 acres dedicated solely for water conservation activities with an additional 2,700 acres for water conservation as the secondary or eventual use. Thus, as mentioned below, this analysis assumes that between three and five recharge facilities will be constructed over the next ten years. Since these activities may affect the jurisdictional waters of the United States, these activities may have a Federal nexus with the ACOE.
119. **Flood Control and Water Management.** The current and planned activities of the San Bernardino County Flood Control District (SBCFCD) are included in the "Flood Control" section below.
120. **Habitat Conservation.** The Santa Ana Wash provides habitat to the kangaroo rat as well as two endangered plant species and 16 other sensitive animal species. These habitat are preserved in the following areas:
- C **Woolly-Star Preservation Area (WSPA)** The WSPA was established in 1988 by the ACOE in an attempt to minimize the effects of Seven Oaks Dam on the federally endangered Santa Ana River woolly-star along the Santa Ana River. Approximately 764 acres of the flood plain downstream of Seven Oaks Dam were preserved by the flood control districts of Orange, Riverside, and San Bernardino counties. The Service estimates that approximately 200 acres of the WSPA are contained within the Unit 1.⁴⁷ Due to the limited number of activities that can occur in the preservation area, the Service is unlikely to conduct consultations in this area.
 - C **Area of Critical Environmental Concern (ACEC).** In 1994, the BLM designated three parcels in the Santa Ana River, a total of 760 acres, as an ACEC. The primary goal in designation was to protect and enhance the habitat of federally listed plant species occurring in the area while providing for the administration of existing valid rights. Although the establishment of this ACEC was important in regard to conservation of sensitive species and communities in this area, the administration of valid existing rights conflicts with the BLM's conservation abilities. Existing rights include a withdrawal of Federal lands for water conservation through an act of Congress on February 20, 1909 (Public, No. 248). The entire ACEC is included in this withdrawn land and may be used for water conservation measures such as

⁴⁷US Fish and Wildlife Service, "Proposed Determination of Critical Habitat for the San Bernardino kangaroo rat," December 8, 2000 (65 FR 77177).

the construction of percolation basins. Therefore, the land may be precluded from residential development or urban growth, but certain water conservation measures may adversely effect the kangaroo rat and thus require consultation with the Service.

121. As with the other MSHCP planning effort mentioned in the previous section, the Service indicates that the Upper Santa Ana River Wash HCP may reduce the scope and/or number of certain types of consultations because future activities are likely to be conducted in a manner that will reduce threats to the kangaroo rat. The Service may also reconsider the boundaries of the kangaroo rat critical habitat if this HCP is finalized, approved, and if it authorizes incidental take for the kangaroo rat. Since it is not currently clear when the HCP will be completed, which boundaries will be changed, or exactly how the consultation process will be affected in this area, the acreage figures provided in the HCP are considered a low estimate of the extent of future activities within Unit 1.

3.3.10 Summary of Impacts of Critical Habitat Designation on Unit 1

122. As mentioned above, between 2,200 to 4,500 acres of land within Unit 1 are projected to become developed over the next ten years. However, zoning and planning efforts by local land owners and managers are likely to constrain this development in Unit 1. These zoning designations may change over the next ten years, but it is unclear whether more land may be zoned for development or preserved for open space. As discussed in Section 2, this analysis uses the current zoning designations as the most accurate indicator of future zoning designations. The following exhibit provides an estimate of the land available for urban development in Unit 1 based on a GIS analysis of the local zoning and planning designations.

Exhibit 3-2								
TOTAL CURRENT PLANNED AREA AND FUTURE DEVELOPMENT POTENTIAL IN UNIT 1								
Land Owner or Manager	Resi- dential	Commer- cial	Industrial	Total Urban Area	Agricul- ture	Open Space	Other	Total Area
Colton	-	17.0	-	17.0	-	-	-	17.0
Loma Linda	10.2	-	-	10.2	-	-	-	10.2
Highland	529.0	29.4	-	558.5	-	2,130.7	-	2,689.2
Redlands	-	-	414.8	414.8	402.4	3,598.5	270.9 (Airport)	4,686.6
San Bernardino	137.6	120.5	186.2	444.3	-	592.7	980.8 (Airport)	2,017.8
San Bernardino County	312.9	-	-	312.9	-	-	2308.7**	2,621.7
Yucaipa	30.7	-	-	30.7	-	-	-	30.7
Total Planned Area	1,020.5	166.9	601.1	1,788.4	402.4	6,322.0	3,560.4	12,073.1
Likely Urban Development 2010- Low***	1,020.5	166.9	601.1	2,207.8*	-	-	-	-
Likely Urban Development 2010- High***	1,020.5	166.9	601.1	4,502.1*	-	-	-	-
*Note: CURBA model projections explained in Section 2. ** Zoning maps unavailable. Assumed to be un-zoned or flood control. *** High and Low projected urban development are assumed to be constrained by the amount of land zoned or planned by the cities for urban development. Source: GIS acreage estimation based on zoning designations provided in the 2000 <i>Inland Empire Photo Atlas</i> , Landiscor Inc., Santa Ana California, March 2000.								

123. Exhibit 3-2 shows that approximately 1,020 acres in Unit 1 are zoned for residential growth, 170 acres are zoned for commercial growth, 600 acres are zoned for industrial growth, 400 acres are zoned for agricultural uses, and 1,250 acres are zoned for airport development. Approximately 1,790 acres are zoned for urban growth (residential, commercial and industrial combined). The CURBA growth model predicts that significantly more areas will be urbanized by 2010. Since the CURBA model does not take local zoning ordinances into consideration, this analysis assumes urban development will be limited to the amount of acres currently zoned for urban growth. In addition, the CURBA model does not consider the planning efforts associated with the Santa Ana

Wash HCP that will limit urban growth in a large portion of Unit 1. Therefore the low and high projections of likely urban development by 2010 are the same as the amount of land currently allowed to be developed as urban in the various city plans.

124. Most of the land zoned for open space in Exhibit 3-2 in the cities of Highland and Redlands, as well as some of the land that is not zoned in the San Bernardino County areas of Unit 1, are included in the Santa Ana Wash area. As mentioned above, approximately 500 to 1,180 acres are likely to be mined for aggregate and construction materials. The potential consultations on flood control and water conservation and supply activities in the wash are considered in the below. As mentioned above, two to four airport activities in San Bernardino, two to four airport associated activities in Redlands, and one to two activities on the BLM land are likely to involve consultations in the future. The impacts critical habitat will have on the number of acres likely to be developed as well as the specific projects within Unit 1 are considered in Section 4.

3.4 Impacts of Critical Habitat Designation on Unit 2

125. Between 4,800 and 9,000 acres of Unit 2 (23 to 44 percent of the entire unit) are projected to be converted into urbanized land in the next ten years. In addition, mining activities, flood control activities, water conservation activities and road maintenance activities are currently taking place and will likely continue in the future in this area. The following section attempts to identify where this development will take place as well as what specific activities will likely occur in the area that may affect the proposed critical habitat for the kangaroo rat.

3.4.1 U.S. Forest Service (USFS), San Bernardino National Forest

126. The portion of the San Bernardino National Forest that has been designated as critical habitat for the kangaroo rat includes state highways, county roads, and utility corridors, as well as areas that could potentially be developed for sand and gravel mining. Over the past five years, the USFS has consulted with the Fish and Wildlife Service approximately four times, generally regarding the installation of pipelines and fiberoptic cables. USFS personnel expect consultations for these land uses to continue at roughly the same rate over the next ten years. This will likely result in approximately eight to ten consultations over the next ten years.⁴⁸

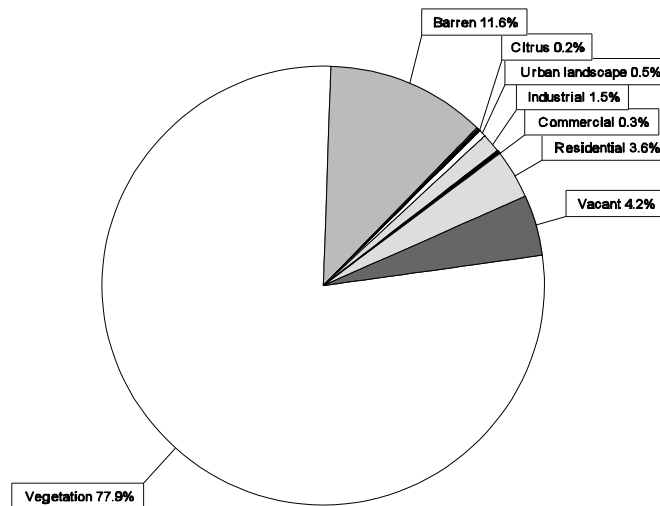
⁴⁸This figure is based on consultations for all portions of the San Bernardino National Forest contained within the proposed critical habitat designation, and thus also includes potential consultations in small USFS areas in Units 1, 3, and 4.

127. The USFS has no plans to expand any of the existing roads. The roads are generally located in floodplains, which will prevent expansion regardless of the habitat designation. Designation of the area as critical habitat will require changes in management of the utility corridors (e.g., limits on where workers can drive equipment), but the USFS is already in the process of implementing such practices as a result of the listing of the kangaroo rat as an endangered species. USFS personnel expect that they will reject any applications for permits to mine for sand and gravel in the critical habitat area.⁴⁹

3.4.2 City of San Bernardino

128. Approximately 5,000 acres of Unit 2 are contained within the City of San Bernardino. The following chart provides the general land use of this area:

San Bernardino Land Use Within Unit 2

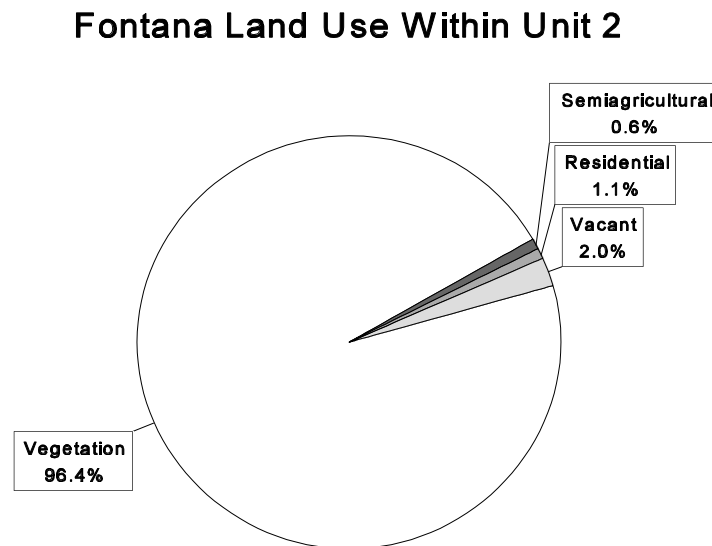


⁴⁹Personal communication with a planner at the USFS on April 30, 2001.

129. Most of Unit 2 that is within the city of San Bernardino, especially south of I-30, south of Route 215, and north of California State University's San Bernardino campus is zoned for public flood control. This zoning designation restricts development, but may encourage the building of flood control levees and dams. A portion of Unit 2 along the Cajon Creek is called the Calmat Specific Plan Area or the Northwest Redevelopment Project Sub-Area B. This 560 acre area is located north of the Devil Creek Diversion Channel, south of I-215 freeway, southeasterly of Palm Avenue, and fronting Cajon Boulevard. This area is zoned for extractive and heavy industrial uses.⁵⁰ A small portion of the southern most tip of Unit 2 is zoned for extractive industrial uses. The regions north of Interstate 215 are generally zoned for light residential growth.

3.4.3 City of Fontana

130. Approximately 2,800 acres of Unit 2 are contained within the City of Fontana. The following chart provides acreage data for the general land uses of this area:



⁵⁰City of San Bernardino Economic Development Agency, "Redevelopment Project Areas." Accessed at http://www.sanbernardino-eda.org/pages/081-Red_Proj_Area_c.htm on May 10, 2001.

131. The portion of Unit 2 along Route 15, southwest of Lytle Creek is contained within the City of Fontana's General Plan. Approximately 2,500 acres (72 percent) of this unit is planned for residential development, while the rest is planned for commercial, public and open space land uses.⁵¹ Exhibit 3-3 gives a detailed breakdown of the acreage of each type of general plan designation within Unit 2.

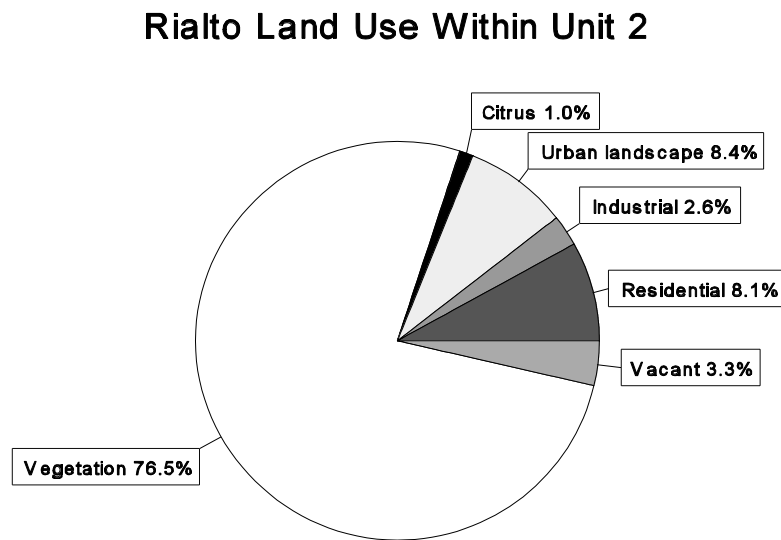
Exhibit 3-3	
CITY OF FONTANA GENERAL PLAN DESIGNATIONS WITHIN UNIT 2	
General Plan Description	Acres
Residential	2,523.2
Residential Estates	558.5
Residential Planned	1,909.0
Single Family Residential	55.7
Commercial	601.9
Community Commercial	1.7
Community Mixed Use	160.9
Regional Mixed Use- Commercial	439.3
Public Facility	367.5
Recreational	44.0
School	11.7
Utility Corridor	311.8
Open Space	35.8
Resource Area	35.8
Source: GIS analysis of the City of Fontana General Plan data layer, updated December 2000, intersected with the Service Proposed Designation of Critical Habitat for the San Bernardino Kangaroo Rat data layer.	

⁵¹GIS analysis of the intersection between the Service's critical habitat designation for the kangaroo rat and the City of Fontana's General Plan data layers.

132. Fontana city planners report no recent projects in the area designated as critical habitat for the kangaroo rat that have required Federal permits or have generated consultations with the Service. The Coyote Canyon residential development is in the planning stages, but has not yet been permitted. Consisting of 323 acres and with 660 planned units, this development may require a Section 404 wetlands permit from the ACOE. Given the size of the development and its location within the designated area, it may also generate a consultation with the Service.⁵² In addition, since approximately 2,500 acres of Unit 2 is planned for residential development in the Fontana General Plan, this analysis assumes that there may be more consultations on large housing projects over the next ten years.

3.4.4 City of Rialto

133. Approximately 1,200 acres of Unit 2 are contained within the City of Rialto. The following chart provides land uses data for this area:



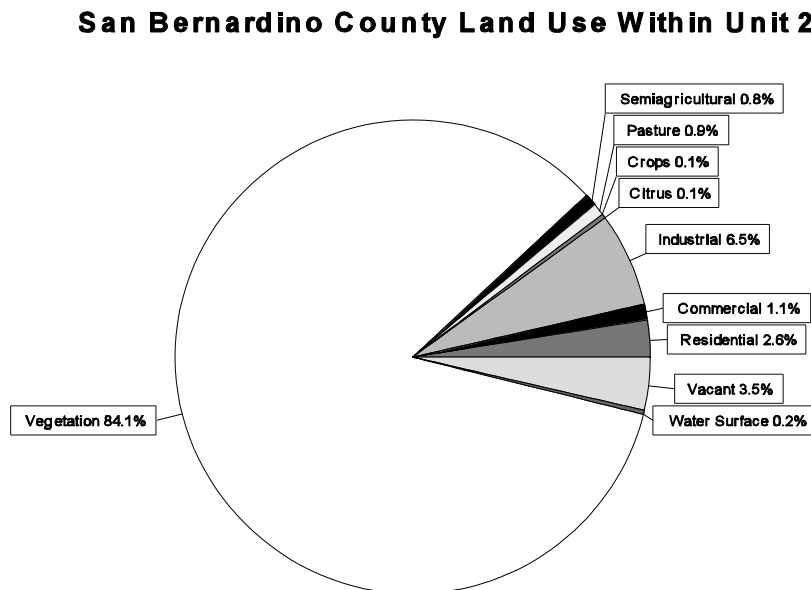
⁵²IEc communication with a Fontana City planner on May 11 and 25, 2001.

134. Small portions of land south of the Lytle Creek wash are contained within Unit 2 and the City of Rialto. Most of these lands are zoned for single family residential homes, while a small portion of the land near the Muscoy CDP is zoned for open space and golf course residential development. Unit 2 also includes a portion of undeveloped land west of the border with the City of Fontana. This area is zoned for planned industrial growth.

135. Plans exist to extend the 210 Freeway west in Rialto within the next few years; an Environmental Impact Statement (EIS) for the expansion has already been completed. City planners expect that this expansion will result in the development of the industrial zone that falls within critical habitat. Such development likely would require permits from Federal agencies including the ACOE, and so consultations with the Service over activities in this area are also possible.⁵³ Rialto has not had any recent development projects that required consultation with the Service nor does the City anticipate any development project that would require Federal permitting in the area designated as critical habitat.

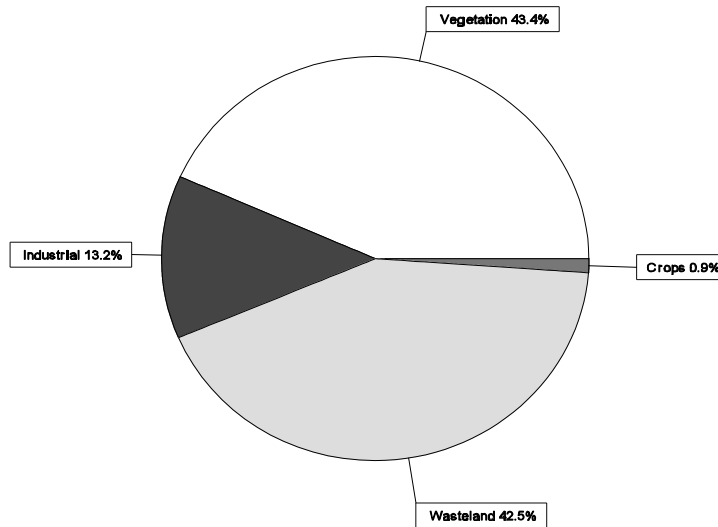
3.4.5 San Bernardino County

136. Approximately 10,900 acres of San Bernardino county and 800 acres of the Muscoy CDP are contained within Unit 2. The following charts provide land use data for these areas:



⁵³Iec communication with a Rialto city planner. May 15, 2001.

Muscoy Land Use Within Unit 2



137. A majority of the central and northern section of Unit 2 is managed by San Bernardino County. Some of the area south of Route 15 between the Lytle and Cajon Creeks is zoned for institutional usage for the Glen Helen Rehabilitation Center and the Glen Helen Regional Park. Other areas are zoned as a floodway. The county is currently developing two plans for development that will fall at least partially in Unit 2 of the proposed critical habitat designation for the kangaroo rat. These two plans are discussed below:

- C ***Glen Helen Specific Plan.*** This 3,334 acre plan falls generally in the unincorporated area between Lytle and Cajon creeks and I-15 and I-215. The plan calls for approximately 270 acres of commercial development, 272 acres of industrial development, a 345-acre golf course and housing development, 400 acres for the existing Sheriff's facilities, 120 acres for the existing Cajon landfill, 90 acres of mixed commercial and residential, 66 acres of flood control areas, 435 acres for existing roads and railroad right-of-ways, and 1,347 acres of open space. The entire plan is likely to encourage a development footprint between 160 and 215 acres.⁵⁴ Portions of this plan zoned as commercial and industrial are included with Unit 2, but the remaining areas are not included within the proposed critical habitat designation.

⁵⁴County of San Bernardino, *Glen Helen Specific Plan Draft Environmental Impact Report*, November 2000. Acreage figures do not add to 3,340 due to rounding.

- C Lytle Creek North Planned Development.* This plan will impact approximately 647 acres of undeveloped land south of I-15 and north of the confluence of the Lytle and Cajon creeks along the north bank of Lytle Creek. This plan will include the construction of a maximum of 2,466 detached single family homes and 172 attached residential units on approximately 432 acres, with an additional 45 acres of commercial/office/light industrial development, 33 acres of new roads and road modifications, 30 acres of landscaped parkways and trail, and a ten-acre elementary school site.⁵⁵ Portions of this development will fall within Unit 2 of the proposed critical habitat designation.

138. The zoning maps for the remainder of San Bernardino County lands within Unit 2 were not available at the time this report was published. It is likely the areas are zoned as a floodway or are un-zoned. Based on analysis of detailed aerial photos and the GIS analysis of the 1993 Aerial Land Use study conducted by the Southern California Association of Governments (SCAG)⁵⁶, approximately 770 acres of county lands in this area are currently used for mining. These mining and extraction operation are conducted primarily by the Western Division of Vulcan Materials Company and Sunwest Materials. As housing and construction material demands increase over the next ten years, mining operations are also likely to expand. This analysis assumes that the extent of mining operations are likely to increase by between 400 and 800 acres over the next ten years. This figure includes the 165 acres zoned for extractive industrial use within the City of San Bernardino mentioned above.
139. Other activities that may involve a Federal nexus on San Bernardino County land include flood control activities conducted by the San Bernardino County Flood Control District, road maintenance and construction, and maintenance of water supply facilities all mentioned below. The land is also used for sparse residential housing and recreational activities that in general do not involve a Federal nexus.
140. Portions of Unit 2 in San Bernardino County are currently under conservation easements that restrict development. The Western Division of the Vulcan Materials Company established the

⁵⁵U.S. Fish and Wildlife Service letter to Los Angeles District, Corps of Engineers regarding the Section 7 Consultation for the Construction and Extension of the North Levee at Sunwest's Lytle Creek Quarry, San Bernardino Co., CA. Undated.

⁵⁶Southern California Association of Governments, "2001 Regional Transportation Plan Update, Map Book 2 of 4," February 1, 2001. Accessed at <http://www.scag.ca.gov/2001rtp/PEIR/Vol2.pdf> on May 23, 2001.

Cajon Creek Conservation Bank (also known as the CalMat conservation bank) in 1996 and 1997 to help conserve populations of 24 species associated with alluvial fan sage scrub habitat, including the kangaroo rat. Currently, 610 acres of the bank are permanently protected, while the remaining 768 acres are under a conservation easement that expires in 2006. The Service is currently working to ensure that the remaining lands within the conservation bank are purchased by 2006. If all of the lands are purchased, approximately 1,400 acres of land will be conserved, including land conserved as mitigation lands for the development of the San Bernardino County's Sheriff's training facility.⁵⁷

3.4.6 Summary of Impacts of Critical Habitat Designation on Unit 2

141. The zoning information outlined above is summarized in the Exhibit 3-4.

Exhibit 3-4							
TOTAL CURRENT PLANNED AREA AND FUTURE DEVELOPMENT POTENTIAL IN UNIT 2							
Land Owner or Manger	Resi- dential	Com- mercial	Industrial	<i>Total Urban</i>	Open Space	Other	<i>Total</i>
Fontana	2,523.2	601.9	-	3,125.1	403.3	-	3,528.4
Rialto	850.7	-	334.1	1,184.8	-	-	1,184.8
San Bernardino	957.7	254.4	220.9	1,433.0	3,394.0	165.7 (mining)	4,992.8
San Bernardino County	264.4	279.3	319.1	862.9	1,485.0	7,091.1**	9,439.0
U.S. Forest Service	-	-	-	-	-	1,307.5 (USFS lands)	1,307.5
Total Planned Area	4,596.0	1,135.6	874.1	6,605.7	5,282.4	8,564.3	20,452.4
Likely Urban Development 2010- Low	3,344.0	826.3	636.0	4,806.2*	-	-	-
Likely Urban Development 2010- High	4,596.0	1,135.6	874.1	8,970.5*	-	-	-
*Note: CURBA model projections explained in Section 2.							
** Zoning maps not readily available. Likely to be un-zoned or flood control.							
Source: GIS acreage estimation based on zoning designations provided in the 2000 <i>Inland Empire Photo Atlas</i> , Landiscon Inc., Santa Ana California, March 2000 and City of Fontana General Plan data layer, updated December 2000							

⁵⁷U.S. Fish and Wildlife Service, *Proposed Designation of Critical Habitat for the San Bernardino kangaroo rat*, December 8, 2000 (65 FR 77177).

142. Exhibit 3-4 shows that approximately 4,600 acres of Unit 2 are planned for residential development, 1,100 are planned for commercial development, and almost 900 acres are planned for industrial development. Therefore, approximately 6,600 acres of Unit 2 has the potential to become developed over the next ten years. However, the low urban development scenario of the CURBA model predicts that only 4,800 acres (approximately 70 percent of the planned urban area) will be developed in the next ten years. In order to account for the lack of development pressure to fill the planned urban area, the number of acres of residential, commercial and industrial growth are reduced by 72.8 percent. The high urban development scenario predicts that more than the area planned for developed will become urbanized in the next ten years. As in Unit 1, the planning and zoning designations are assumed to limit the future growth, thus only those areas planned for development will become urbanized over the next ten years. In addition to the residential, urban and industrial growth, there are likely to be between eight and ten activities on USFS land that could result in a consultation with the Service.

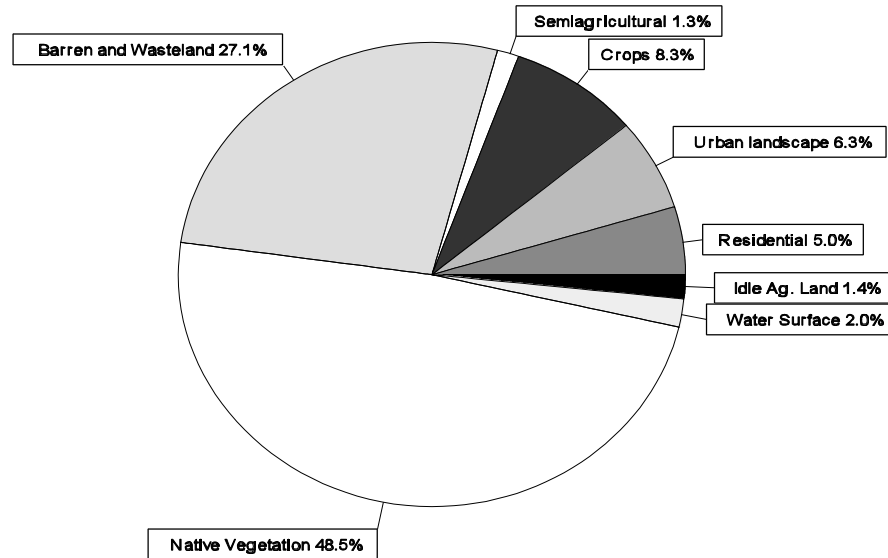
3.5 Impacts of Critical Habitat Designation on Unit 3

143. As mentioned in the Section 2, between 770 and 2,100 acres of Unit 3 (eight to 21 percent of the entire unit) are projected to be urbanized in the next ten years. In addition, the mining , flood control, water conservation, and agricultural activities that are currently taking place within this unit will likely continue. The following section attempts to identify where this development will take place as well as which specific activities are likely to occur in the area which may affect the proposed critical habitat for the kangaroo rat.

3.5.1 The City of San Jacinto

144. Approximately 1,000 acres of the City of San Jacinto are contained within Unit 3. The following chart provides land use data for this area.

San Jacinto Land Use Within Unit 3



145. Most of the land contained within the City of San Jacinto and Unit 3 is zoned for controlled development along the San Jacinto River flood plain. This zone is intended to establish developmental control on land that is moderately to severely impacted by flooding or similar problems. Single family residential development is permitted in this zone, with a minimum lot size of 0.5 acres. Small parcels in the upland areas are zoned for single family residential (minimum lot size is 0.17 acres), commercial (minimum lot size is 0.12 acres) and senior development (minimum lot size is 0.46 acres).⁵⁸

146. The City of San Jacinto has several significant construction projects planned in the area of the proposed kangaroo rat critical habitat. It completed construction of a bridge across the San Jacinto River to the Soboba Indian Reservation approximately six months ago. While this was a city project, the Reservation played a key role in obtaining funding from the Bureau of Indian Affairs and the Federal Highway Administration. There was a consultation with the Service, although a city planner stated that project modifications (e.g., planting in the river bed for purposes of mitigation) were done at the request of the ACOE rather than the Service.

⁵⁸City of San Jacinto fax to IEC regarding "Zone SD and W-2" on May 10, 2001.

147. Currently, the city is working with Riverside County on a plan to widen the river and install a permanent levy along its southern bank. The county is currently in the process of acquiring land for this project. City planners anticipate that widening the river will require a consultation with the Service.
148. The City of San Jacinto is also in the process of expanding the Ramona Expressway, the city's main thoroughfare. The city has already purchased rights of way for this extension, and these parcels extend through areas of proposed critical habitat, approximately 300 feet from the existing levy. City planners anticipate consulting with the Service for this project, and one planner speculated that offsetting/conservation measures may need to be incorporated as part of the project design.
149. There is additional development underway in proximity to the area designated as critical habitat. A 251-lot residential subdivision is currently under construction within approximately 1,500 feet of the river. A city planner who was interviewed was unaware of any Federal permits or consultations required for this project. In addition, a developer is planning a 37-acre industrial park for a location approximately one half mile south of the river. This park is intended to house light manufacturing facilities with a capacity of roughly 300 jobs but may not include any of the proposed critical habitat. City planners anticipate that this development will require Section 404 wetlands permitting from the ACOE.⁵⁹

3.5.2 Soboba Indian Reservation

150. Approximately 1,149 acres of Unit 3 are contained within the Soboba Indian Reservation. Portions the Reservation that have been designated as critical habitat are currently undeveloped and there are no plans to develop them in the foreseeable future. Historically, the Reservation cooperated with the City of San Jacinto in constructing a bridge over the San Jacinto River during the past two years. This bridge was permitted by the ACOE and required a consultation with the Service, as described above.⁶⁰ There is a sand mining facility and a five-acre test plot for a water percolation project in the river currently operating on Tribal lands that fall within the proposed critical habitat designation.

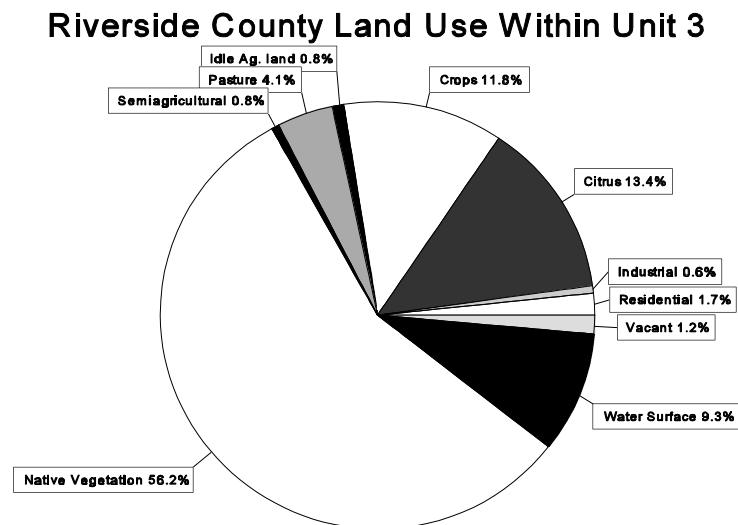
⁵⁹IEc communication with a San Jacinto city planner, May 24, 2001.

⁶⁰IEc communication with the environmental staff at the Soboba Indian Reservation, May 9, 2001.

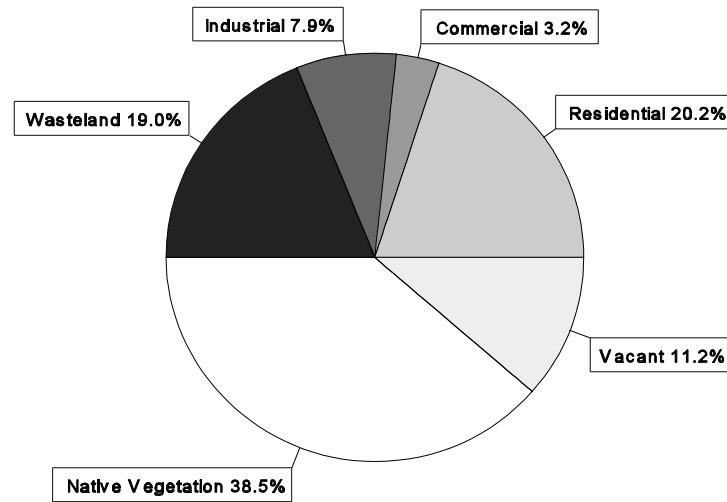
151. The Service indicates that an expansion of the five-acre water percolation project to a 100-acre percolation site called the San Jacinto Storage and Recovery Project is likely to occur as part of a settlement between the Tribe, the Municipal Water District of Southern California, and the U.S. Government. This analysis estimates that the Tribe will be involved in one section 7 consultation regarding this percolation site over the next ten years. In addition, as a high estimate, this analysis assumes that the Tribe will enter into an additional consultation with the Service regarding the continued operation of the sand mining facility. Therefore, the Tribe is likely to be involved in one to two section 7 consultations over the next ten years.

3.5.3 Riverside County

152. Approximately 8,500 acres of the unincorporated areas of Riverside County and 620 acres in the Valle Vista CDP are contained within Unit 3. The following charts provide land use data for these areas.



Valle Vista Land Use Within Unit 3



153. A majority of Unit 3 falls within unincorporated areas of Riverside County. The northernmost region of Unit 3 is zoned for agricultural, single family dwellings and rural residential development. A small area near the Quail Ranch Golf Course along Jack Rabbit Trail is zoned for mining. County zoning maps for the remainder of Unit 3 were not available at the time of publication of this analysis. However, the Riverside County Integrated Project is currently developing an update to the county General Plan. Draft planning maps indicate that almost all of the Unit 3 is planned for conservation and conservation habitat land uses. Small areas are planned for residential, agricultural, and recreational uses. A segment of Unit 3 along the Bautista Wash in the vicinity of Valle Vista is planned for commercial and low to medium residential uses.⁶¹ A small portion of the southeastern region of Unit 3 within the San Bernardino National Forest also falls within the county's existing Riverside's Extended Mountain Area Plan (REMAP). This region is not planned for development. The rest of the Unit 3 does not fall within any community plans.⁶²

⁶¹Riverside County Integrated Project, Draft General Plan Maps, 2000. Accessed at <http://www.rcip.org/maps.htm> on June 1, 2001.

⁶²Riverside County Planning Department, "Frequently Asked Questions." Accessed at <http://www.tlma.co.riverside.ca.us/plan/faq.htm> on May 16, 2001.

154. Staff at the Riverside County Transportation and Land Management Agency indicate that the draft land use planning designations in Unit 3 will tend to restrict any type of development that may have a Federal nexus. For example, lands planned for conservation will generally remain open space. Other planning designations limit development to one dwelling unit per 20 acres. Some residential or commercial development may occur near Valle Vista that may have a Federal nexus with the ACOE.⁶³ This potential development is considered in Exhibit 3-5 below.

3.5.4 Summary of Impacts of Critical Habitat Designation on Unit 3

155. Exhibit 3-5 provides a summary of the zoning designations discussed above.

Exhibit 3-5						
TOTAL CURRENT PLANNED AREA AND FUTURE DEVELOPMENT POTENTIAL IN UNIT 3						
Land Owner or Manager	Resi- dential	Total Urban	Agri- culture	Open Space	Other	Total
Riverside County	204.4	204.4	852.2	6337.0	165.8 (Mining)	7,559.5
Soboba Indian Reservation	-	-	-	-	1,149.0 (Tribal Lands)	1,149.0
San Jacinto	554.1	554.1	-	419.4	-	973.5
U.S. Forest Service	-	-	-	-	419.3 (USFS Lands)	419.3
Total Planned Area	758.5	758.5	852.2	6756.5	1,734.1	10,101.3
Likely Urban Development 2010- Low**	758.5	765.6*				
Likely Urban Development 2010- High**	758.5	2,115.8*				
*Note: CURBA model projections explained in Section 2. ** High and Low projected urban development are assumed to be constrained by the amount of land zoned or planned by the cities for urban development. Source: GIS acreage estimation based on zoning designations provided in the 2000 <i>Inland Empire Photo Atlas</i> , Landiscover Inc., Santa Ana California, March 2000.						

156. Exhibit 3-5 shows that approximately 760 acres of land in Unit 3 is planned for residential development. The low scenario of CURBA model predicts that 766 acres will be developed and the

⁶³Personal communication with Administrative Manager, Riverside County Transportation and Land Management Agency on June 1, 2001.

high urban growth scenario predicts that 2,100 acres will become urbanized. As with Unit 1, the city and county zoning and planning designations are likely to restrict the future development predicted by the CURBA model.

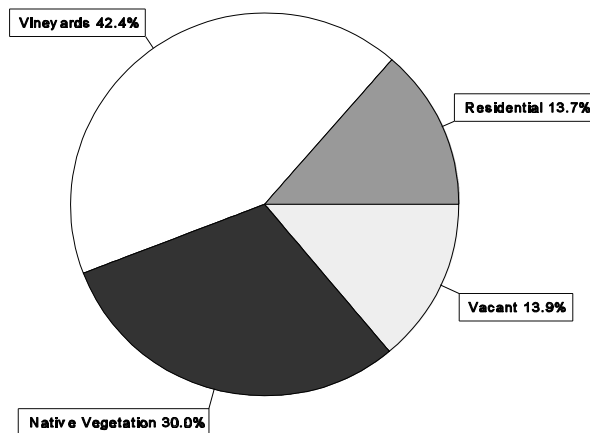
3.6 **Impacts on Critical Habitat Designation on Unit 4**

157. As mentioned in the Section 2, between 2,500 and 4,100 acres of Unit 4 (26 to 43 percent) are projected to be urbanized in the next ten years. In addition, flood control activities and water conservation and supply activities are currently taking place and will likely continue in the future in this area. The following section attempts to identify where this development will take place as well as what specific activities will likely occur in the area that may affect the proposed critical habitat for the kangaroo rat.

3.6.1 **City of Fontana**

158. Approximately 1,550 acres of the City of Fontana are contained within Unit 4. The following chart provides land use data for this area.

Fontana Land Use Within Unit 4



159. Much of the southeast portion of Unit 4 is contained within the general planning area of the City of Fontana. The northern portion of this overlap area between Unit 4 and the City of Fontana is planned for residential growth and regional mixed use/commercial development. The southern region is planned for industrial uses and a large utility corridor. Relatively little of this area is planned for open space. Based on GIS analysis, the precise acreage amount of each type of land use contained within Unit 4 and the City of Fontana is presented below in Exhibit 3-6.

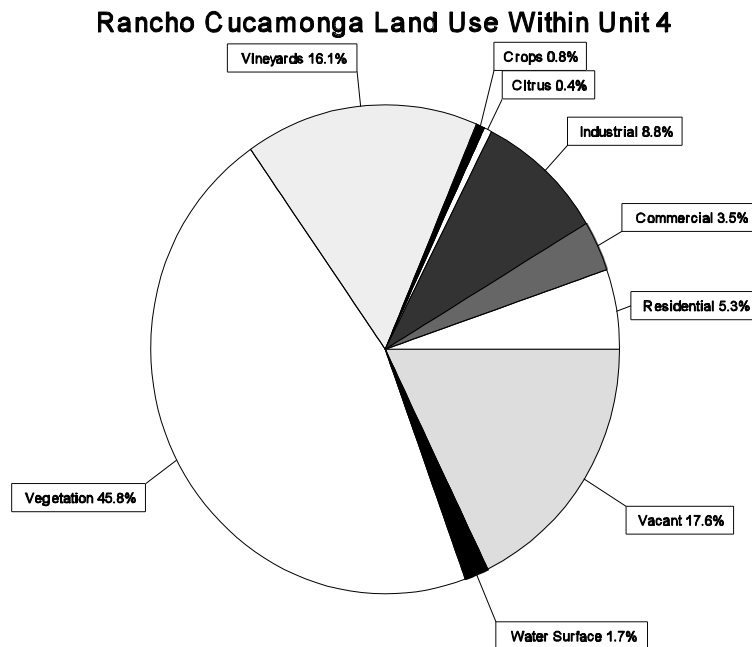
Exhibit 3-6	
CITY OF FONTANA GENERAL PLAN DESIGNATIONS WITHIN UNIT 4	
General Plan Description	Acres
Residential	888.5
Residential Estates	0.1
Low Density Residential	27.4
Residential Planned	861.0
Commercial	360.1
Community Commercial	23.6
General Commercial	24.2
Community Mixed Use	34.9
Office Professional	8.4
Regional Mixed Use- Commercial	269.0
Industrial	159.8
Planned Industrial	30.9
Industrial Specific Plan	128.9
Public Facility	325.8
Recreational	69.4
School	11.0
Utility Corridor	245.4
Open Space	54.2
Natural Area	36.6
Resource Area	17.6
Source: GIS analysis of the City of Fontana General Plan data layer, updated December 2000, intersected with the Service Proposed Designation of Critical Habitat for the San Bernardino Kangaroo Rat data layer.	

160. In accordance with the general planning efforts outlined above, the City of Fontana has already approved specific plans for three large residential/commercial projects within Units 2 and 4. These projects include Summit Heights, Sierra Lakes, and Westgate. Federal permits may be required for either the construction of these projects or for the provision of water and electricity to

these developing areas.⁶⁴ Section 7 consultations and other impacts associated with these and other future projects are assessed in Section 4.

3.6.2 City of Rancho Cucamonga

161. Approximately 3,300 acres of the City of Rancho Cucamonga are contained within Unit 4. The following chart provides land use data for this area:



162. Almost all of Unit 4 not contained within the City of Fontana's General Plan is contained within the City of Rancho Cucamonga's General Plan, including almost all of the unincorporated areas of San Bernardino County. Most of the northern regions of Unit 4 are planned for open space, hillside residential development and very low density residential growth. The middle of the portion of Unit 4 contained within the City of Rancho Cucamonga is planned for commercial and residential growth. The southern portion is planned for general and heavy industrial development. A more detailed analysis of the planning designations are presented below.

⁶⁴"Comments on the December 8, 2000 Proposal of the U.S. Fish and Wildlife Service to Designate Critical Habitat for the San Bernardino Kangaroo Rat," submitted by San Bernardino Valley Municipal Water District, et al, on February 5, 2001.

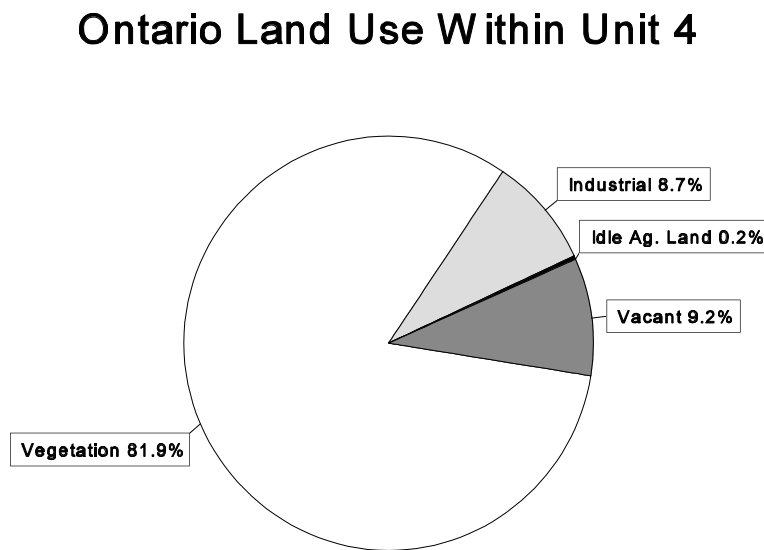
Exhibit 3-7		
CITY OF RANCHO CUCAMONGA GENERAL PLAN DESIGNATIONS WITHIN UNIT 4		
General Plan Description	Acres	Percent of Total Acres
Residential	1,976.7	27.5%
Very Low	909.3	12.6%
Low	596.1	8.3%
Low Medium	309.9	4.3%
Medium	105.8	1.5%
Medium High	45.0	0.6%
High	10.7	0.1%
Commercial	535.0	7.4%
Commercial	377.8	5.3%
Regional Commercial	91.4	1.3%
Office	47.0	0.7%
Neighborhood Commercial	18.8	0.3%
Industrial	490.8	6.8%
General Industrial	266.3	3.7%
Heavy Industrial	224.5	3.1%
Public Facilities	146.9	2.0%
Park	105.5	1.5%
Elementary School	30.5	0.4%
High School	10.9	0.2%
Open Space	3,930.0	54.6%
Flood Control/Utility Corridor	3,111.9	43.3%
Hillside Residential	488.9	6.8%
Open Space	329.2	4.6%
Major Roads	114.3	1.6%
Total	7,193.79	
Source: GIS analysis of the City of Rancho Cucamonga General Plan data layer intersected with the Service Proposed Designation of Critical Habitat for the San Bernardino Kangaroo Rat data layer.		

163. The ACOE is aware of several large development projects planned to occur within Unit 4 in the Etiwanda wash area. These projects include the Catellus Development Corporation's Rancho Pacific Distribution Center, a commercial development in Rancho Cucamonga, along with ten large

housing projects.⁶⁵ An example of one of these housing project is the 25-acre Lauren Development residential housing site just west of the Deer Creek Channel. At least a portion of this planned development is contained within Unit 4 of the proposed critical habitat designation.⁶⁶ Some or all of these projects may require a permit from ACOE and consultation with the Service.

3.6.3 City of Ontario

164. Approximately 150 acres of the City of Ontario are contained within Unit 4. The following chart provides land use data for this area.



165. All of the area within the City of Ontario and Unit 4 is contained within the Ontario North Industrial specific plan. Industrial development in this area may require ACOE permits. Potential development on this land is considered in Section 4.

⁶⁵Personal communication with Army Corps of Engineers, Los Angeles Office, on May 15, 2001.

⁶⁶Comment letter from Hewitt & McGuire, LLP to the U.S. Fish and Wildlife Service regarding the Proposed Designation of Critical Habitat for the San Bernardino Kangaroo Rat on February 6, 2001.

3.6.4 San Bernardino County

166. Approximately 4,550 acres of Unit 4 are included within the unincorporated areas of San Bernardino County. These areas are currently undeveloped and are over 95 percent native vegetation. Almost all of these areas are included in the Fontana and Rancho Cucamonga General Plans, and thus the future activities in these areas are included in the discussion above.

3.6.5 Summary of Impact of Critical Habitat Designation on Unit 4

167. Exhibit 3-8 below summarizes the development potential in Unit 4 based on the zoning designations discussed above.

Exhibit 3-8							
TOTAL CURRENT PLANNED AREA AND FUTURE DEVELOPMENT POTENTIAL IN UNIT 4							
Land Owner or Manager	Resi- dential	Com- mercial	Industrial	Total Urban	Open Space	Other	Total
Fontana	888.5	360.1	159.8	1,408.3	380.0	-	1,788.3
Ontario	-	-	141.7	141.7	-	-	141.7
Rancho Cucamonga	1,976.7	535.0	490.8	3,002.6	4,076.9	114.3 (Major Roads)	7,193.8
Total Planned Area	2,865.2	895.1	792.3	4,552.6	4,456.9	114.3	9,123.8
Likely Urban Development 2010- Low	1,568.9	490.1	433.8	2,492.8*	-	-	
Likely Urban Development 2010- High	2,565.1	801.4	709.3	4,075.7*	-	-	
*Note: CURBA model projections explained in Section 2. Source: GIS acreage estimation based on zoning designations provided in the 2000 <i>Inland Empire Photo Atlas</i> , Landiscor Inc., Santa Ana California, March 2000; City of Fontana General Plan data layer, updated December 2000; and City of Rancho Cucamonga General Plan data layer.							

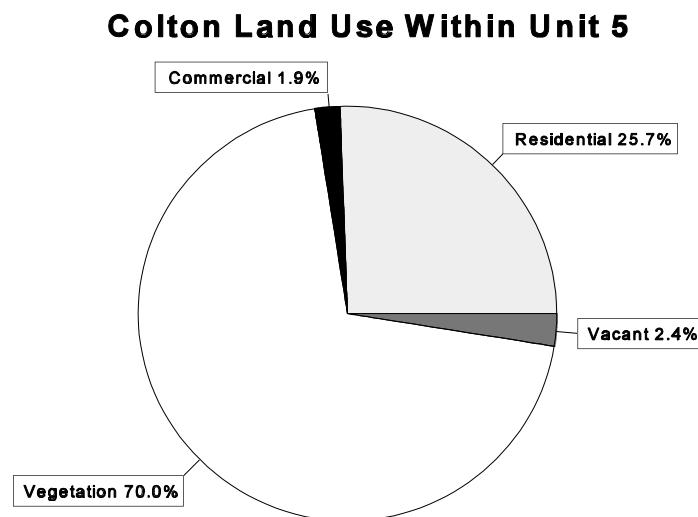
168. Exhibit 3-8 shows that approximately 4,550 acres of Unit 4 are planned for urban growth. However, the CURBA model predicts that only 2,500 to 4,100 acres of land are likely to be developed based on population projections for the region. This is likely due to the fact that most of the city plans in Unit 4 are designed to accommodate growth in the long term. Therefore, this analysis reduces the number of acres planned by the cities for residential, commercial, and industrial growth to reflect the development pressure predicted by the CURBA model.

3.7 Impacts of Critical Habitat Designation on Unit 5

169. As mentioned in the Section 2, approximately half of Unit 5 is already developed, and between 50 and 75 acres (15 to 23 percent of the unit) are projected to be urbanized in the next ten years. Unit 5 currently encloses residential developments, water supply facilities, and a large municipal cemetery.

3.7.1 City of Colton

170. Approximately 150 acres of the City of Colton are contained within Unit 5. The following chart provides land use data for this area.



171. The northern portion of Unit 5 is contained within the City of Colton. This area is zoned for both high density residential growth and residential estates. The high density area can be developed with a maximum density of one dwelling unit per 0.067 acres with a maximum coverage of 70 percent of each lot. The residential estates zoning can be developed with a maximum density of one dwelling unit per 0.5 acres, with a maximum coverage of 20 percent of each lot.

172. The City of Colton has not had any projects in the area proposed as critical habitat for the kangaroo rat that have needed permits or required consultation with the Service in the last four years.⁶⁷ The city currently is planning several projects in the proposed critical habitat area to satisfy infrastructure needs. These include the construction of a \$4 million water tank, water pipeline improvements in the Reche Canyon Area, and the widening of Reche Canyon Road.⁶⁸ These activities and similar future activities are considered in the road maintenance and water supply activities sections below.

3.7.2 Cities of San Bernardino and Loma Linda

173. San Bernardino and Loma Linda each contain less than ten acres of Unit 5. The land is currently either vacant, or contains native vegetation and sparse residential growth. All of the land is zoned for light residential growth.

3.7.3 San Bernardino County

174. Approximately 110 acres of Unit 4 is included within the unincorporated areas of San Bernardino County. Of these acres, 15 are currently under residential development, and the remaining 95 acres are native vegetation. All of this area is currently zoned by the county for residential estates.

⁶⁷IEc communication with a Colton city planner. May 15, 2001.

⁶⁸Letter from Best, Best & Krieger, May 23, 2001

3.7.4 Summary of Critical Habitat Designation Impacts on Unit 5

175. Exhibit 3-9 shows the development potential for each land owner and manager in Unit 5.

Exhibit 3-9 TOTAL CURRENT PLANNED AREA AND FUTURE DEVELOPMENT POTENTIAL IN UNIT 5	
Land Owner or Manager	Residential
Colton	197.4
Loma Linda	5.2
San Bernardino	6.3
San Bernardino County	109.7
Total Planned Area	318.6
Likely Urban Development 2010- Low	46.8*
Likely Urban Development 2010- High	74.3*
*Note: CURBA model projections explained in Section 2. Source: GIS acreage estimation based on zoning designations provided in the 2000 <i>Inland Empire Photo Atlas</i> , Landiscor Inc., Santa Ana California, March 2000.	

176. All of Unit 5 is currently zoned for residential urban growth. However, over half of the unit is already developed. Beyond these developed areas, the CURBA model predicts that between 50 and 75 acres will likely be developed in the next ten years. Based on current zoning designations, all of this growth will likely be residential growth.

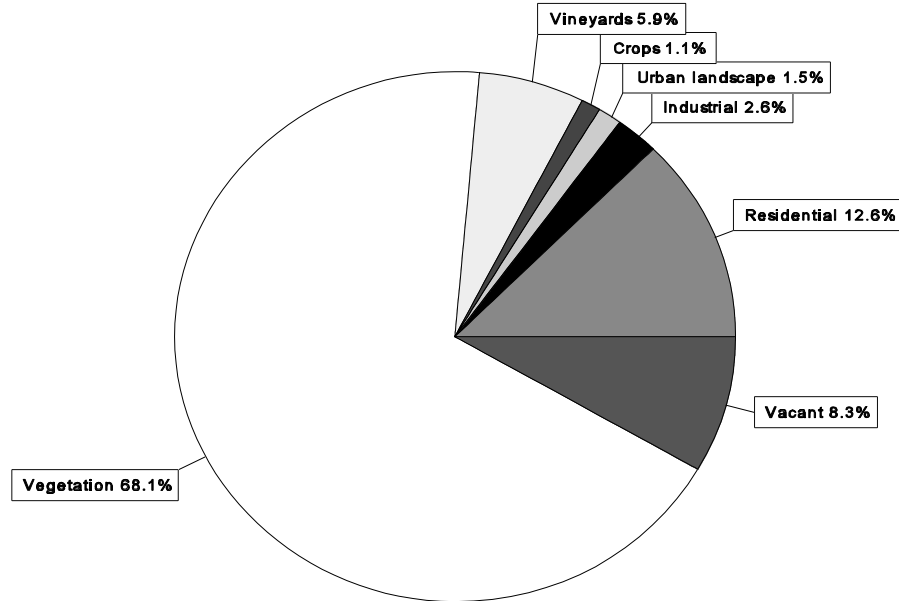
3.8 Impacts of Critical Habitat Designation on Unit 6

177. As mentioned in Section 2, approximately one quarter of Unit 6 is already developed, and between 525 and 1,050 acres (19 and 38 percent of the unit) are projected to be urbanized in the next ten years. Unit 6 currently encloses dense residential developments, water supply facilities, and undeveloped areas.

3.8.1 City of Fontana

178. Approximately 2,100 acres of the City of Fontana are contained within Unit 6. The following chart provides land use data for this area.

Fontana Land Use Within Unit 6



179. According to the Fontana General Plan, the northern portion of the western half of Unit 6 is planned for industrial growth. The northern portion of the eastern half of Unit 6 is zoned for commercial and residential development. Some of the areas in the center parts of the unit are planned for residential and planned community growth while the mountainous areas are zoned for open space. A more detailed picture of the planning designations is presented below in Exhibit 3-10.

180. Currently, several development projects are planned within Unit 6. The city has approved a specific plan for the Southridge Village Community, a large residential and commercial development within the proposed critical habitat designation. Plans for a 500-acre business complex within Unit 6 are currently being revised and reviewed.⁶⁹ The economic impacts of the designation of critical habitat on these projects will be addressed in Section 4.

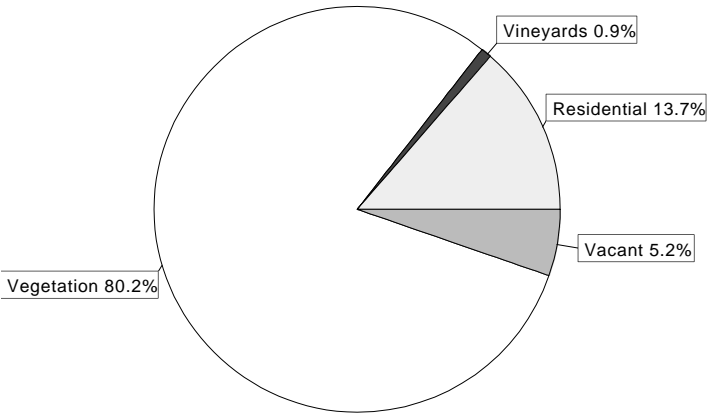
⁶⁹"Comments on the December 8, 2000 Proposal of the U.S. Fish and Wildlife Service to Designate Critical Habitat for the San Bernardino Kangaroo Rat," submitted by San Bernardino Valley Municipal Water District, et al, on February 5, 2001.

Exhibit 3-10	
CITY OF FONTANA GENERAL PLAN DESIGNATIONS WITHIN UNIT 6	
General Plan Description	Acres
Residential	797.8
Low Density Residential	323.1
Residential Planned	261.7
Single Family Residential	213.0
Commercial	202.0
Community Commercial	38.6
General Commercial	0.0
Office Professional	5.4
Regional Commercial	158.0
Industrial	120.9
General Industrial	49.1
Planned Industrial	71.8
Public Facility	383.2
Public Facility	77.3
Recreational	188.0
School	4.9
Utility Corridor	113.0
Open Space	555.5
Natural Area	516.0
Resource Area	39.4
Source: GIS analysis of the City of Fontana General Plan data layer, updated December 2000, intersected with the Service Proposed Designation of Critical Habitat for the San Bernardino Kangaroo Rat data layer.	

3.8.2 San Bernardino and Riverside Counties

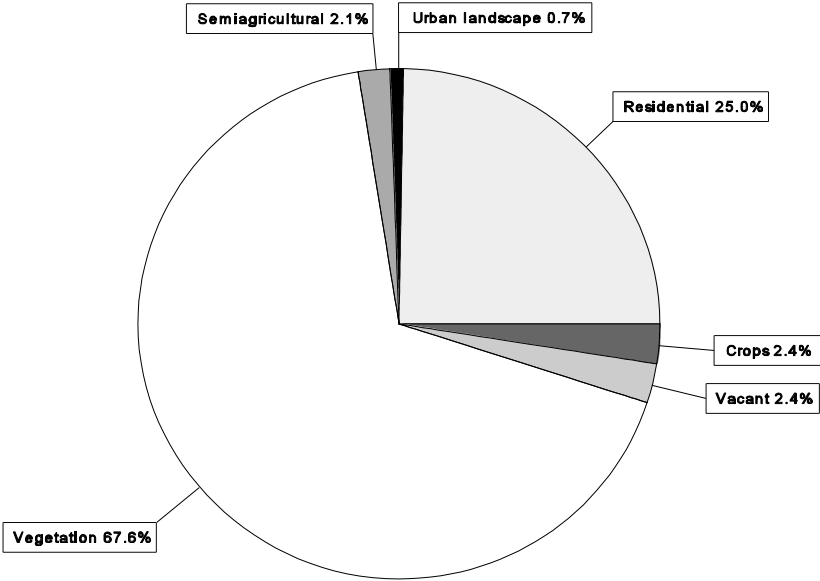
181. Approximately 350 acres of San Bernardino and Riverside counties are contained within Unit 6. The following chart provides land use data for this area.

San Bernardino and Riverside County Land Use Within Unit 6



182. Approximately 325 acres of the Bloomington CDP in San Bernardino County are included within Unit 6. Land use data for this area is provided in the following chart.

Bloomington Land Use Within Unit 6



183. All of the areas in Bloomington and in the unincorporated areas of San Bernardino County within Unit 6 are included in the Fontana General Plan area. Therefore, future activities on these lands are included in the discussion above.
184. Unit 6 also contains approximately 20 acres each of the Glen Avon and Sunnyslope CDPs in Riverside County. Native vegetation currently covers most of these areas. However, approximately 11 acres in Sunnyslope are residential. The western portion of the Riverside County land in Unit 6 is currently zoned by the county for residential growth. The eastern portion is zoned for industrial manufacturing uses. Potential economic impacts to activities on these lands are considered in Section 4.

3.8.3 Summary of Impacts of Critical Habitat Designation on Unit 6

185. Exhibit 3-11 summarizes the zoning and potential development information discussed above.

Exhibit 3-11						
TOTAL CURRENT PLANNED AREA AND FUTURE DEVELOPMENT POTENTIAL IN UNIT 6						
Land Owner or Manager	Residential	Commercial	Industrial	Total Urban	Open Space	Total
Fontana	797.8	202.0	120.9	1,120.7	938.6	2,059.3
San Bernardino County	325.2	-	-	325.2		325.2
Riverside County	87.9	-	241.0	328.9	-	328.9
Total Planned Area	1,210.9	202.0	361.9	1,774.7	938.6	2,713.4
Area Currently Developed	474.7	79.2	141.9	695.7*		
Area Planned for Future Development	736.2	122.8	220.0	1,079.0		
Likely Urban Development 2010- Low	358.2	59.7	107.0	525.0*		
Likely Urban Development 2010- High	714.3	119.1	213.5	1,046.8*		
*Note: CURBA model projections and data explained in Section 2. Source: GIS acreage estimation based on zoning designations provided in the 2000 <i>Inland Empire Photo Atlas</i> , Landis Corp., Santa Ana California, March 2000 and City of Fontana General Plan data layer, updated December 2000						

186. Exhibit 3-11 shows that approximately 1,800 acres of Unit 6 is planned for urban development. However, approximately 700 of these acres are already developed with dense urban development.⁷⁰ These areas are not likely to be developed further, and thus are not likely to require ACOE permits for construction activities. Therefore, the total assumed area planned for residential, urban and commercial development is reduced by 700 acres in this report to give the total amount of area available for future development.⁷¹ The CURBA model predicts that between 525 and 1,050 acres of land in Unit 6 will be developed in the next ten years. The number of acres planned for future residential, commercial, and industrial urban growth are reduced to reflect the low and high CURBA model predictions.

3.9 Water Supply and Conservation Activities

187. The proposed critical habitat designation intersects with the jurisdiction of several local municipal water districts whose purpose is to supply the current and future residents of San Bernardino and Riverside counties with adequate supplies of high quality water. In order to fulfill this purpose, the water supply districts must construct and maintain facilities that pump groundwater to the surface, transmit water throughout the region, treat and de-salinate water sources, and recharge groundwater with natural and recycled water flows. These facilities are often located in or next to rivers, creeks, and dry washes that are inhabited by the kangaroo rat. Thus, current operation and maintenance activities and the future construction activities for each of the major water supply districts may require section 7 consultations and are described in the following sections.⁷²

3.9.1 Metropolitan Water District of Southern California

188. The Metropolitan Water District of Southern California (MWD) provides supplemental water to the southern California coastal plain to augment local water supplies developed by surface catchment, groundwater production, and wastewater reclamation. MWD receives water from the State Water Project and the Colorado River Aqueduct and delivers it to 26 MWD member agencies. The member agencies, some of which are listed below, serve approximately 17 million people living

⁷⁰Based on CURBA model and on-site observations on January 8, 2001.

⁷¹Note: This calculation was not performed for Units 1, 2, 3, and 4 because the current development in these units is generally sparse and may undergo additional development over the next ten years.

⁷²Since water district boundaries and their projects sometimes overlap with several of the proposed critical habitat units, each water district is discussed separately in this section instead of in the unit specific sections above.

within a 5,200-square-mile area.⁷³

189. Units 1, 2, 3, 4, and 6 of the proposed critical habitat designation included portions of MWD's facilities and rights-of-way. These facilities include sections of six pipelines (Inland Feeder, Upper Feeder, Etiwanda, Rialto, Santa Ana Valley, and San Diego No. 2), the Colorado Aqueduct, and the Etiwanda Power Plant. Due to the short time frame for which to respond to data inquiries for this analysis, MWD was unable to provide an accurate yearly estimate of the number of projects required to maintain the facilities within the proposed critical habitat designation.⁷⁴ This analysis assumes that between one and two operation and maintenance activities with a Federal nexus will occur at each of these facilities over the next ten years. If more information can be gathered, this assumption will be revisited in the addendum to this draft economic analysis.
190. MWD indicates no plans exist for the construction of new facilities in the proposed designation of critical habitat.⁷⁵ However, in order to account for potential future projects beyond MWD's planning horizon, this analysis assumes that MWD may conduct between two and three major construction projects that may require a Federal permit over the next ten years.

3.9.2 San Bernardino Valley Municipal Water District

191. The San Bernardino Valley Municipal Water District (San Bernardino Valley) boundaries overlap with approximately 12,100 acres of Unit 1, 15,600 acres of Unit 2, and all of Unit 5.⁷⁶ San Bernardino Valley currently maintains facilities on the Santa Ana River, Lytle Creek, Mill Creek, Plunge Creek, Waterman Creek, Cajon Wash, and Reche Canyon. Based on the permitting procedures of the ACOE, this analysis assumes that operation or maintenance activities for one or two facilities on each of these watersheds will likely require a section 404 permit over the next ten years.
192. The San Bernardino Valley has recently adopted its Master Plan for Regional Water

⁷³Comment letter from the Metropolitan Water District of Southern California to the U.S. Fish and Wildlife Service regarding the Proposed Designation of Critical Habitat for the San Bernardino Kangaroo Rat on February 6, 2001.

⁷⁴Facsimile from the Metropolitan Water District of Southern California to IEC on May 31, 2001.

⁷⁵Personal communication with Principal Environmental Specialist, Metropolitan Water District of Southern California, on May 29, 2001.

⁷⁶GIS analysis of Santa Ana Watershed Project Authority, Water District Boundaries shape file, 1993, accessed at <http://www.sawpa.net> on May 1, 2001. The acreage figure cited in the remainder of the Water Districts section are also based on this GIS analysis

Facilities. This plan calls for the construction of approximately 15 projects within the proposed critical habitat designation. These projects include wells, reservoirs, large diameter pipelines, pumping facilities, and other appurtenances, which all may have a Federal nexus with the ACOE. In addition, the Master Plan calls for the coordinated use of several ground water cleanup facilities already installed by EPA and the State of California.⁷⁷ EPA funding or approval may constitute a nexus in this case. Finally, the San Bernardino Valley is considering coordinating with the Western Municipal Water District of Riverside County (Western Water District) to utilize water conservation infrastructure already installed on the Seven Oaks Dam and construct a pipeline to bring conserved water to both the East Branch Extension of the State Water Project and the Inland Feeder of the MWD.⁷⁸ The ACOE has indicated to the San Bernardino Valley and other water districts that water conservation activities are not currently proposed at the Seven Oaks Dam, and that an additional section 7 consultation will be needed before water conservation can take place at the dam.⁷⁹ These planned projects are summarized in Exhibit 3-12 below.

3.9.3 Western Municipal Water District of Riverside County

193. The Western Water District includes approximately 200 acres of Unit 6 within its district boundaries. In addition, Western Water District is a full partner of the San Bernardino Valley Municipal Water District in connection with the Seven Oaks Dam water conservation activities. Western Water District's current water supply depends in part on the upper portion of the Gage Canal that is contained within Unit 1 of the proposed critical habitat designation. In addition, the proposed critical habitat includes facilities of the Riverside Highland Water Company which rely on water from both Lytle Creek and the Santa Ana River.⁸⁰ This analysis assumes that between one and two operation and maintenance projects for each of these existing facilities may require an ACOE permit over the next ten years.
194. Western Water District is a proponent of the Riverside-Corona Feeder Project (RCFP) that may include a well field within the proposed critical habitat. The RCFP will be designed to pump ground water underlying downtown San Bernardino to portions of Western's service, for purposes

⁷⁷Letter from Best, Best & Krieger, LLP to IEC, Inc., regarding "United States Fish and Wildlife Service Economic Analysis of the Proposed Designation of Critical Habitat for the San Bernardino Kangaroo Rat," on May 23, 2001.

⁷⁸"Comments on the December 8, 2000 Proposal of the U.S. Fish and Wildlife Service to Designate Critical Habitat for the San Bernardino Kangaroo Rat," submitted by San Bernardino Valley Municipal Water District, et al, on February 5, 2001.

⁷⁹Letter from Planning Division Chief, ACOE to Flood Control Engineer, County of San Bernardino on May 29, 2001.

⁸⁰Letter from Best, Best & Krieger, May 23, 2001

of drought protection. This project may require both Federal funding and possible ACOE permits.

3.9.4 West San Bernardino County Water District

195. The West San Bernardino County Water District (WSBCWD) is a member of the Lytle Creek Water Conservation Association which operates a 200-acre spreading ground along and within Lytle Creek. This analysis assumes that, due to the size of the spreading grounds, between two and four operation and maintenance activities on these existing facilities may require ACOE permits over the next ten years.

196. The WSBCWD is planning to construct several other infrastructure projects in the proposed critical habitat for the kangaroo rat. These projects include the installation of a 24-inch water line across Lytle Creek to serve a new development in the area. In addition, the WSBCWD plans to build a seven-acre surface water reservoir within proposed kangaroo rat critical habitat.⁸¹ These planned projects are summarized in Exhibit 3-12.

3.9.5 Inland Empire Utilities Agency

197. The Inland Empire Utilities Agency (IEUA) district boundaries include approximately 2,000 acres of Unit 2, 7,700 acres of Unit 4, and 400 acres of Unit 6. The IEUA currently operates more than 20 water spreading basins along the Etiwanda, San Sevaine, and San Antonio Channels in western San Bernardino County. This analysis assumes that between one and two operation and maintenance activities on each of these channels may require an ACOE permit over the next ten years.

198. The IEUA has planned to construct dozens of infrastructure projects, including water transmission lines, water conveyance and pumping facilities, and de-salters within the proposed designation of critical habitat in the coming years. This analysis assumes that all of these projects may require an ACOE permit. A summary of the IEUA's current and planned projects is included in Exhibit 3-12.

3.9.6 Chino Basin Watermaster

199. The Chino Basin Watermaster (Chino) is an entity established in 1978 to adjudicates an area of approximately 232 square miles in western San Bernardino and Riverside counties. This area is underlain by the Chino Basin, a groundwater reservoir that contains approximately five million acre-feet of water. Portions of Unit 2, 4, and 6 are contained in Chino's adjudication area. Chino currently owns and operates six basins (including the Rich, San Sevaine, Victoria, Upper Day, Lower Day, and Hickory basins), Etiwanda Conservation Ponds, the Etiwanda Spreading Grounds,

⁸¹Letter from Best, Best & Krieger, May 23, 2001

and the RP-3 percolation ponds within the proposed critical habitat designation. This analysis assumes that between one and two operation and maintenance activities on each of these facilities may require an ACOE permit or involve Federal funding over the next ten years.

200. The Superior Court of the State of California recently approved and directed the implementation of an Optimum Basin Management Program (OBMP) for the Chino Basin region. In implementing the OBMP, Chino anticipates utilizing Federal and State funding to fully utilize its existing facilities and to construct additional facilities. With the exception of the Rich Basin, all of the facilities mentioned above are planned for either new or increased use per the OBMP Implementation Plan. Chino is also proposing to construct a Etiwanda Debris Basin in Unit 4.⁸² All of these planned activities are considered in Exhibit 3-12.

3.9.7 Lake Hemet Municipal Water District/ Eastern Municipal Water District

201. The Lake Hemet Municipal Water District (Lake Hemet WD) and the Eastern Municipal Water District (Eastern WD) operate and maintain approximately six spreading and recharge basins within Unit 3 along the upper San Jacinto River. These facilities include the Grant Street Ponds, the Cienega Recharge Ponds, the Alessandro Ponds, the State Water Project recharge ponds, and the upper and lower Fruitvale basins.⁸³ This analysis assumes that between one and two operation and maintenance activities on each of these facilities may require an ACOE permit over the next ten years.

202. In the coming years, Lake Hemet WD hopes to expand its Grant Street Ponds and Cienega Recharge Ponds. Eastern WD is planning to add approximately 100 acres of spreading grounds to augment each of its current facilities. This analysis assumes that all of these projects may require an ACOE permit in the next ten years. A summary of Lake Hemet WD's and Eastern WD's current and planned projects is included in Exhibit 3-12.

3.9.8 San Bernardino Valley Water Conservation District

203. The San Bernardino Valley Water Conservation District (SBVWCD) is a public agency whose goal is to percolate and conserve water by recharging groundwater for eventual public uses. The SBVWCD currently owns approximately 2,600 acres in Unit 1. Some of this land is leased for mining operations and other uses and some of the land is used for the diversion of Santa Ana River water through earthen canals to two groundwater recharge basins. These basins are used to recharge

⁸²Comment letter from the Chief of Watermaster Services, Chino Basin Watermaster to the U.S. Fish and Wildlife Service regarding the Proposed Designation of Critical Habitat for the San Bernardino Kangaroo Rat on February 6, 2001.

⁸³GIS analysis of Santa Ana Watershed Project Authority, Water District Facilities shape file, 1993, accessed at <http://www.sawpa.net> on May 1, 2001.

the Bunker Hill Groundwater Basin which supplies water to about 800,000 people.⁸⁴ The SBVWCD indicates that operation and maintenance activities on these facilities will not require future consultation with the Service because the primary constituent elements are not present.⁸⁵ As a conservative estimate, this analysis assumes that between one and two operation and maintenance activities on these recharge basins may require an ACOE permit.

204. The SBVWCD anticipates the construction of three additional basins in the Santa Ana Wash as part of the Land Management and HCP for the Upper Santa Ana River Wash discussed in the Unit 1 section above. This analysis assumes that all three of these projects may require an ACOE permit.

3.9.9 Water Supply and Conservation Activities Summary

205. Exhibit 3-12 summarizes the estimated number of water supply and conservation projects that may have a Federal nexus over the next ten years. A low and a high scenario is presented to properly reflect the uncertainty in the number of potential future projects. The "Current" category describes the number of ongoing operation and maintenance activities with Federal nexuses occurring within the proposed critical habitat areas. The "Future" category includes potential future projects conducted by water districts, as described above.

⁸⁴Santa Ana River Wash Coordinated Planning Activities Committee, "Draft Proposed Land Management and Habitat Conservation Plan for the Upper Santa Ana River Wash," May 2000.

⁸⁵Personal communication with Deputy Manager for Land Resources, SBVWCD on May 21, 2001.

Exhibit 3-12						
ESTIMATED WATER SUPPLY AND CONSERVATION PROJECTS WITHIN PROPOSED CRITICAL HABITAT FOR THE KANGAROO RAT (TEN YEARS)*						
Water Supply District	Current		Future		Total	
	Low	High	Low	High	Low	High
MWD	8	16	2	3	10	19
San Bernardino Valley	8	16	17	26	25	42
Western Water District	2	4	1	2	3	6
WSBCWD	2	4	2	3	4	7
IEUA	3	6	12	18	15	24
Chino	8	16	8	12	16	28
Lake Hemet WD/Eastern WD	6	12	6	9	12	21
SBCWCD	1	2	3	5	4	7
Total Projects	38	76	51	77	89	153
*Note: All figures represent the estimated number of projects over the next ten years.						
Source: Estimates based on information provided by the affected water districts, February to May, 2001.						

3.10 Flood Control Activities

206. The proposed designation of critical habitat for the kangaroo rat contains several active rivers, creeks, flood plains, and dry wash systems in the vicinity of large urban population centers. Flood control activities in this area consist of constructing levees, berms, concrete channels, and spreading basins. These activities are carried out by the San Bernardino County Flood Control District and the Riverside County Flood Control and Water Conservation District.

3.10.1 San Bernardino County Flood Control District (SBCFCD)

207. The SBCFCD provides flood control services for the San Bernardino Valley from the border of Los Angeles County east to Yucaipa. These services are provided through the construction and maintenance of flood control facilities including dams, conservation basins, river channels, storm drains and access roads. The SBCFCD's main activities that may affect the proposed critical habitat designation include facility construction, operation, and maintenance. General operation and maintenance activities include the removal of soil and sediment from recharge and spreading basins, the maintenance of levee slopes and access roads, the clearing of vegetation (native and non-native)

for fire control, and removing sediments from the channel bottoms.⁸⁶ The flood control activities conducted by the SBCFCD generally require ACOE permits since they impact jurisdictional waters of the United States.

208. SBCFCD staff indicate that ACOE permits are generally issued for the maintenance or construction of all of the facilities on a creek, river or watershed system.⁸⁷ The SBCFCD currently maintains facilities on the following creek, river and watershed systems within the proposed critical habitat designation⁸⁸:

- C **Unit 1:** Santa Ana River, Mill Creek, City Creek, Oak Creek, Plunge Creek, San Timoteo Creek
- C **Unit 2:** Lytle Creek, Cajon Creek
- C **Unit 4:** San Sevine Channel, Etiwanda Wash, Etiwanda alluvial fan
- C **Unit 5:** Reche Canyon Channel
- C **Unit 6:** None

209. This analysis assumes that over the next ten years, the facilities on each creek system within the critical habitat designation will require between one and two permits from the ACOE for construction, maintenance and operation activities. The estimated number of future SBCFCD flood control projects that are likely to have a Federal nexus is provided in Exhibit 3-13 below.

3.10.2 Riverside County Flood Control and Water Conservation District (District)

210. The District plans, funds, designs, constructs and maintains major flood control facilities in Riverside County. It owns and operates 40 dams and several hundred miles of storm drains, channels and levees. The District maintains several levees and basins on the San Jacinto River, Potrero Creek, and the Bautista Wash that are within Unit 3 of the proposed designation of critical habitat. Several smaller creeks either flow into the San Jacinto and are included in the proposed critical habitat designation.

⁸⁶Personal communication with Division Chief for Environmental Management, SBCFCD on May 21, 2001.

⁸⁷District staff also indicate that the SBCFCD is currently considering applying for a programmatic permit to reduce the number of permits and consultations required. While this approach may reduce the paperwork, it will not likely reduce the avoidance and mitigation measures the SBCFCD will have to conduct for each of its facilities.

⁸⁸Comment letter from County of San Bernardino Land Use Services Department to the U.S. Fish and Wildlife Service regarding the Proposed Designation of Critical Habitat for the San Bernardino Kangaroo Rat on February 9, 2001.

211. The District currently obtains ACOE permits for its construction and maintenance activities and occasionally obtains funding from the Federal Emergency Management Agency (FEMA).⁸⁹ This analysis assumes that the district will require between one and two permits for construction and maintenance activities for each river or creek on which it has levees and basins within Unit 3. The District may also construct new flood control facilities on smaller creeks that feed into the San Jacinto, that may require ACOE permits for those activities. This analysis assumes that the District will conduct between five and ten activities that require Federal permits or funding over the next ten years. Exhibit 3-13 provides a summary of the estimates of the number of flood control projects in both San Bernardino and Riverside counties over the next ten years:

Exhibit 3-13		
FLOOD CONTROL PROJECTS WITHIN THE PROPOSED DESIGNATION OF CRITICAL HABITAT FOR THE KANGAROO RAT (TEN YEARS)		
Critical Habitat Unit	Flood Control Projects	
	Low	High
Unit 1 (SBCFCD)	6	12
Unit 2 (SBCFCD)	2	4
Unit 3 (District)	5	10
Unit 4 (SBCFCD)	3	6
Unit 5 (SBCFCD)	1	2
Unit 6 (SBCFCD)	0	0
Total	17	34
Source: Comment letter from County of San Bernardino Land Use Services Department to the U.S. Fish and Wildlife Service regarding the Proposed Designation of Critical Habitat for the San Bernardino Kangaroo Rat on February 9, 2001.		

3.11 Road Maintenance and Construction

212. The proposed critical habitat designation includes many miles of Federal, State and local highways and roads. The operation and maintenance on these roads may include rehabilitation of old pavement, construction of highway medians, bridge replacement, and shoulder widening. These activities may affect critical habitat areas, and often involve Federal funding from the Federal Highway Administration. In addition, road maintenance activities may impact jurisdictional waters of the U.S. and thus require an ACOE permit.

⁸⁹Personal communication with Associate Engineer, Riverside County Flood Control District on May 22, 2001.

213. Currently, District 8 of the California Department of Transportation (Caltrans) is involved in a series of improvement projects along Interstate 15. Project 1 of this series is taking place on I-15 north of the intersection with Sierra Avenue in Fontana, an area which falls within Unit 2. This project involves Federal Demonstration Funds and thus has some Federal involvement.⁹⁰

214. Based on GIS analysis of the major roads in the proposed critical habitat area, the designation of critical habitat may affect operations on nearly 30 miles of Federal highways and ramps, and almost 90 miles of secondary roads. These roads include three major interstate highways, seven state highways, and approximately 64 streets, roads, avenues, and parkways.⁹¹ Caltrans indicates that every major highway in the San Bernardino Valley is slated to undergo construction for improvements or expansion in the next ten years.⁹² Caltrans has also developed a schedule of proposed construction projects along the 15-mile section of Interstate 15 that is contained within Units 2 and 4 of the proposed critical habitat designation over the next ten years. This schedule indicates that there are likely to be three construction or maintenance projects on this stretch of road over the next ten years (approximately one project every five miles).⁹³ Based on this information, this analysis makes the following assumptions:

- C **Federal Highways:** On a typical ten mile stretch of Federal highway within the proposed critical habitat, it is likely that between two and four construction or rehabilitation projects are likely to occur over the next ten years.
- C **Secondary Roads:** On a typical ten mile stretch of secondary roads within the proposed critical habitat, it is likely that between one and two construction or rehabilitation projects are likely to occur over the next ten years. Secondary roads are assumed to require less maintenance because on average they support less traffic than Federal highways.

⁹⁰"Caltrans District 8 Current Projects, I-15 Improvement," accessed at http://www.dot.ca.gov/dist8/projects/15_improve.htm on May 25, 2001.

⁹¹Based on GIS analysis of Environmental Research Systems, Inc., California Major Roads shape file, 2000. Portions of roads were not included in the counts if less than 0.1 mile were found within proposed critical habitat.

⁹²Personal communication with Public Affairs, Caltrans Eighth District on May 25, 2001.

⁹³Facsimile from Project Manager, Caltrans to IEC regarding "Proposed Construction Project Along I-15 Between I-10 and Victorville," on May 29, 2001. Assumptions based on the fact that minor roads are less traveled and thus require less maintenance and have less pressure to expand.

215. Based on the mileage estimates determined using GIS analysis and the assumptions presented above, this analysis assumes that there will be between 6 and 12 construction or maintenance projects on Federal highways, and between 9 and 18 construction or maintenance projects on secondary roads over the next ten years. Therefore, there will likely be between 15 and 30 road-related construction or maintenance projects over the next ten years within the proposed critical habitat designation for the kangaroo rat.

3.12 Summary of Likely Development and Activities within the Proposed Critical Habitat Designation

216. The following exhibit summarizes the number of acres that will likely be developed within the designation based on local zoning and planning efforts and the predictions of the CURBA model. In addition, future activities that will likely have a Federal nexus within the proposed critical habitat designation for the kangaroo rat are included.

Exhibit 3-14

**SUMMARY OF LIKELY DEVELOPMENT AND ACTIVITIES WITHIN THE
PROPOSED DESIGNATION OF CRITICAL HABITAT*
(TEN YEARS)**

Critical Habitat Units		Residential (acres)	Commercial (acres)	Industrial (acres)	Mining (acres)	Airports (projects)	Flood control (number of permits)	Water Supply and Conservation (projects)	Roads (projects)	Federal Agencies/ Tribal Actions (projects)
Unit 1	Low	1,020	167	601	500	4	6	-	-	1
	High	1,020	167	601	1,180	8	12	-	-	2
Unit 2	Low	3,344	826	636	400	-	2	-	-	8
	High	4,596	1,136	874	800	-	4	-	-	10
Unit 3	Low	758	-	-	-	-	5	-	-	1
	High	758	-	-	-	-	10	-	-	2
Unit 4	Low	1,569	490	434	-	-	3	-	-	-
	High	2,565	801	709	-	-	6	-	-	-
Unit 5	Low	47	-	-	-	-	1	-	-	-
	High	74	-	-	-	-	2	-	-	-
Unit 6	Low	358	60	107	-	-	-	-	-	-
	High	714	119	213	-	-	-	-	-	-
Total	Low	7,097	1,543	1,778	900	4	17	89	15	10
	High	9,729	2,223	2,398	1,980	8	34	153	30	14

*Note: Units of measurement are given in parentheses in the header of each column

Source: Based on GIS analyses and estimates of local zoning and planning designation as well as information provided by land owners and managers potentially affected by the proposed critical habitat designation.

ESTIMATED COSTS OF THE DESIGNATION OF CRITICAL HABITAT FOR THE KANGAROO RAT

SECTION 4

217. This section describes the total economic cost of the designation of critical habitat for the kangaroo rat over the next ten years. First, this section defines the types of economic impacts likely to be encountered within the boundaries of critical habitat, regardless of whether those impacts can be attributed co-extensively to other causes, such as the listing. Next, the number of incremental technical assistance efforts, surveys, consultations, project modification and re-initiations that are likely to result from the designation of critical habitat for the kangaroo rat as well as the per-unit costs of each of these activities are presented. Based on these estimates, a total cost estimate is derived for the designation and other regulations such as the listing. Finally, the percentage of these costs attributable solely to the designation of critical habitat is calculated.

4.1 Categories of Economic Impacts Associated with Critical Habitat

218. The following list is a generalized description of the types of economic impacts that might arise due to the designation of critical habitat. While the consultation process is tailored to each project, this description represents a generalized cost impact scenario.

4.1.1 Technical Assistance

219. In the proposed rule to designate critical habitat for the kangaroo rat, the Service indicates that, if an affected land owner or manager has any questions regarding whether specific activities will likely constitute destruction of adverse modification of critical habitat, then he or she should contact the Carlsbad Fish and Wildlife Office. This analysis assumes that all managers of large projects that fall within critical habitat over the next ten years will likely contact the Service for technical assistance.

4.1.2 Kangaroo Rat Surveys

220. As Federal agencies issue permits, provide funding, or plan actions, they may conduct a kangaroo rat biological survey or require a third party applicant to conduct the survey. The surveys involve a habitat assessment and three to five consecutive nights of trapping on site. Because these surveys are relatively costly, repeat surveys by third parties for activities that take place on

previously surveyed areas may not happen. Approximately 30 percent of the area proposed to be designated as critical habitat for the kangaroo rat was identified as occupied or potentially occupied in the final rule listing the species as endangered. Thus, this analysis assumes that 30 percent of the proposed critical habitat area has been surveyed and thus projects on this area will not require additional surveys.

4.3.1 Section 7 Consultations

221. Section 7(a)(2) of the Act requires Federal agencies (action agencies) to consult with the Service whenever activities that they undertake, authorize, permit, or fund may affect a listed species or designated critical habitat. There are scenarios under which the designation of critical habitat can result in section 7 consultations with the Service that are incremental to those required by the listing. These include:

- C New consultations, which can occur when activities involving a Federal nexus are proposed in critical habitat not thought to be currently occupied by the species; and
- C Re-initiations of consultations, which result when consultations that previously occurred under the listing are re-initiated due to new information or circumstances generated by the designation.

222. In these cases, the Service, the Action agency, and the land owner applying for Federal funding or permitting (if applicable) communicate in an effort to minimize potential adverse effects to the species and/or to the proposed critical habitat. Communication between these parties may occur via written letters, phone calls, in-person meetings, or any combination of these. The duration and complexity of these interactions depends on a number of variables, including the type of consultation, the species, the activity of concern, the region where critical habitat has been proposed, and the land owner.

223. Section 7 consultations with the Service may be either informal or formal. *Informal consultation*, which consists of informal discussions between the Service, the Action agency, and the applicant concerning an action that may affect a listed species or its designated critical habitat, is designed to identify and resolve potential concerns at an early stage in the planning process. By contrast, a *formal consultation* is required if the Service finds that the proposed action is likely to adversely affect the listed species or designated critical habitat in ways that cannot be resolved through informal consultation. Regardless of the type of consultation or proposed project, section 7 consultations can require substantial administrative effort on the part of all participants. Based on historical section 7 consultations for the kangaroo rat, this analysis assumes that 75 percent of all future consultations will be completed informally, and 25 percent will be completed formally.

4.1.4 Re-initiation of Consultation

224. A section 7 consultation may need to be re-initiated by the Action agency if the project is ongoing and within the area proposed as critical habitat. For all ongoing projects, the Service will likely review the biological opinion and/or other documents relating to the project. This process will result in either a non-substantive re-initiation or a substantive re-initiation. A non-substantive re-initiation occurs when the Service determines that additional effort is not necessary because the original consultation considered all of the potential adverse impacts to the kangaroo rat habitat on the project site. If the Service determines that a substantive re-initiation is necessary, it will likely contact the Action agency to discuss further actions.

225. Based on conversations with the Service, this analysis assumes that between five and seven of the completed section 7 consultations will be re-initiated due to the designation of critical habitat, and that 75 percent of these re-initiations will be non-substantive.

4.1.5 Summary of Assumptions

226. Several assumptions were presented in Section 4.1 above. The following is a summary of these assumptions:

C ***Technical Assistance.*** All managers of large projects that fall within critical habitat over the next ten years will likely contact the Service for technical assistance.

C ***Kangaroo Rat Surveys.*** 30 percent of the large projects that fall within critical habitat will not require additional surveys.

C ***Section 7 Consultations.*** All large projects with a Federal nexus that fall within critical habitat will require a section 7 consultation. 75 percent of these will be completed informally and 25 percent will be completed formally.

C ***Re-initiation of Consultation.*** Between five and seven of the past section 7 consultations will be re-initiated. 75 percent of these re-initiations will be non-substantive and 25 percent will be substantive.

4.2 Number of Impacts

227. Section 3 of this report estimated the types and extent of development activities and other activities that are likely to occur over the next ten years within the area proposed as critical habitat. Based on this information, this section will attempt to determine the number of major projects that will likely be impacted by the regulations associated with section 7 of the Act. This section will also

determine how many technical assistance interactions, protocol surveys, section 7 consultations, and re-initiations will likely result from the designation of critical habitat. Please note that many of these impacts would have occurred due to the listing and are not attributable solely to the designation of critical habitat.

4.2.1 Critical Habitat Impacts

228. The following analysis considers available information regarding the number of acres of land likely to be developed within the proposed critical habitat designation to determine the number of impacted projects. It also determines how many projects are likely to require technical assistance, kangaroo rat surveys, and section 7 consultations. This analysis is based on the following assumptions:

- C ***Residential Development.*** Based on the information on planned residential communities within the proposed critical habitat designation presented in Section 3, large residential projects generally range in size from 25 acres to 432 acres, with an average size of approximately 280 acres. However, large projects often receive more attention in a community, so large projects may have been reported on more frequently than small projects by local planners and developers. Therefore, this analysis assumes that one large residential project will occur on every 100 acres of undeveloped residential land. This assumption results in a conservative (i.e., high end) estimate of the number of future projects likely to occur within the proposed critical habitat.
- C ***Commercial Development.*** Based on the information provided in Section 3, commercial projects planned for construction within the proposed critical habitat generally range in size from 15 acres to 500 acres. This analysis assumes that one large commercial project will occur on every 100 acres of undeveloped commercial land.
- C ***Industrial Development.*** Based on the information provided in Section 3, industrial parks planned for construction within the proposed critical habitat generally range in size from 37 acres to 220 acres. This analysis assumes that one large industrial project will occur on every 50 acres of undeveloped industrial land.

- C **Mining.** Mining sites are assumed to be 150 acres, based on the average mining site size within the Santa Ana wash.⁹⁴
- C **Federal Nexus.** The percentage of projects that are likely to have a Federal nexus is difficult to determine; no database records all of the Federal permits and funding provided by all potential action agencies in a given area. Based on conversations with the ACOE, and the occurrence of rivers, creeks, streams and other drainage features in the proposed critical habitat area, this analysis assumes that 50 percent of large residential, commercial, and industrial projects will require a Federal permit. All of the airport related projects are assumed to have a Federal nexus though Federal Aviation Authority oversight or funding. All of the Federal agency actions are assumed to have a Federal nexus because they occur on Federal land. All of the Tribal projects identified in this analysis are assumed to have a Federal nexus through the Bureau of Indian Affairs. Most (75 percent) of the mining, flood control, water supply and conservation, and road construction projects are assumed to have a Federal nexus because they are likely to occur in or adjacent to jurisdictional waters of the U.S.⁹⁵
- C **Survey Percentage.** As mentioned above, 70 percent of all future section 7 consultations are likely to involve a survey based on the number of core areas within the critical habitat designation that have already been surveyed.

229. Exhibit 4-1 uses the assumptions outlined above to predict the number of projects that are likely to occur in the proposed critical habitat designation based on the potential development and activities outlined in Section 3. From this information, the number of expected technical assistance efforts, section 7 consultations, and protocol surveys are estimated.

⁹⁴Santa Ana River Wash Coordinated Planning Activities Committee, "Draft Proposed Land Management and Habitat Conservation Plan for the Upper Santa Ana River Wash," May 2000.

⁹⁵Based on personal communication with Ecologist, U.S. Army Corps of Engineers, Seven Oaks Dam Resident Office, on May 10, 2001.

Exhibit 4-1 PREDICTED NUMBER OF IMPACTS ASSOCIATED WITH THE PROPOSED CRITICAL HABITAT DESIGNATION (TEN YEARS)					
Type of activity	Scenario	Potential development and activities (acres of number of projects)	Number of large projects requiring technical assistance	Number of Section 7 consultations	Number of Consultations with surveys
Residential (acres)	Low	7,097	71	35	25
	High	9,729	97	49	34
Commercial (acres)	Low	1,543	15	8	5
	High	2,223	22	11	8
Industrial (acres)	Low	1,778	36	18	12
	High	2,398	48	24	17
Mining (acres)	Low	900	6	5	3
	High	1,980	13	10	7
Airports (projects)	Low	4	4	4	3
	High	8	8	8	6
Flood control (number of permits)	Low	17	17	13	9
	High	34	34	26	18
Water Supply and Conservation (projects)	Low	89	89	67	47
	High	153	153	114	80
Roads (projects)	Low	15	15	11	8
	High	30	30	23	16
Federal Agencies Actions (projects)	Low	10	10	10	7
	High	14	14	14	10
Total	Low	n/a	263	170	119
	High	n/a	419	278	195
Source: Based on GIS analyses and estimates of local zoning and planning designation as well as information provided by land owners and managers potentially affected by the proposed critical habitat designation.					

230. The actual number of incremental consultations may be lower or higher than these estimates, depending on future economic activity within the areas designated as critical habitat, as well as the decisions of private, state, local, and Federal landowners. In addition, the analytic approach used to derive the estimated number of consultations cannot account for unforeseen activities and projects. Therefore, the estimates presented here should be interpreted as reasonable approximations.

231. Exhibit 4-2 presents the number of formal and informal consultations based on the total number of section 7 consultations presented in Exhibit 4-1 and the assumption presented above that 75 percent of the future consultations will be completed informally and 25 percent will be completed formally. Exhibit 4-2 also presents the number of substantive and non-substantive re-initiations based on the assumptions presented above.

Exhibit 4-2					
PREDICTED NUMBER OF FORMAL AND INFORMAL CONSULTATIONS AND RE-INITIATIONS (TEN YEARS)					
Scenario	Total Section 7 Consultations	Informal Section 7 Consultations	Formal Section 7 Consultations	Non-Substantive Re-initiations	Substantive Re- initiations
Low	170	128	43	4	1
High	278	209	70	5	2
Source: Based on GIS analyses and estimates of local zoning and planning designation as well as information provided by the Service and land owners and managers potentially affected by the proposed critical habitat designation.					

4.3 Estimated Costs of Incremental Surveys, Consultations, and Technical Assistance

232. Cost estimates for technical assistance are based on an analysis of past technical assistance efforts provided by the Carlsbad Fish and Wildlife Office. Technical assistance costs represent the estimated economic costs of informational conversations between landowners or managers and the Service regarding the designation of critical habitat for kangaroo rat. Most likely, such conversations will occur between municipal or private property owners and the Service regarding lands designated as critical habitat or lands adjacent to critical habitat. Costs associated with these phone calls include the opportunity cost of time spent in conversation, as well as staff costs.
233. Survey costs are based on the cost to survey a typical 100-acre project site to determine the presence or absence of the kangaroo rat. These surveys consist of a habitat assessment to determine where to place traps, three to five nights of surveying, and the preparation of a brief report on the methodology and findings.⁹⁶ Based on conversations with the ACOE and the Service, this analysis assumes that the cost of conducting a kangaroo rat survey is always borne by the applicant. Costs to the Action agency are assumed to range from no costs to the costs associated with spending one day reviewing the survey report.

⁹⁶Cost estimates based on personal communication with Senior Staff at Jones & Stokes Associates, Inc., Irvine CA, on May 22, 2001. Confirmed by cost estimate of historical survey made by City of Colton, in letter from Best, Best & Krieger, May 23, 2001.

234. Estimates of the cost of an individual consultation were developed from a review and analysis of historical section 7 files from a number of Service field offices around the country. These files addressed consultations conducted for both listings and critical habitat designations. Cost figures were based on an average level of effort for consultations of low, medium, or high complexity, multiplied by the appropriate labor rates for staff from the Service and other Federal agencies. Estimates take into consideration the level of effort of the Service, the Action agency, and the applicant during both formal and informal consultations, as well as the varying complexity of consultations. Informal consultations are assumed to involve a low to medium level of complexity. Formal consultations are assumed to involve a medium to high level of complexity.
235. Section 7 consultation costs include the administrative costs associated with conducting the consultation, such as the cost of time spent in meetings, preparing letters, and in some cases the development of a biological assessment and biological opinion. Because kangaroo rat consultations generally involve more than one species, administrative costs are not likely to be wholly attributable to the kangaroo rat. Therefore, these consultation costs estimates are likely to overestimate the costs attributable to the kangaroo rat.
236. The costs of reinitiating a consultation are assumed to be similar to conducting the original consultation because the re-initiation generally involves time spent in meetings and preparing letters. This analysis assumes that the economic impact associated with a non-substantive re-initiation is similar to the cost of an informal consultation and the economic impact associated with a substantive re-initiation is similar to the cost of a formal consultation.
237. Estimated costs associated with technical assistance calls, protocol surveys, section 7 consultation and re-initiations are presented in Exhibit 4-3.

Exhibit 4-3				
ESTIMATED COSTS OF CRITICAL HABITAT IMPACTS				
Critical Habitat Impact	Scenario	Service	Action Agency	Third Party
Technical Assistance Effort	Low	\$50	\$0	\$28
	High	\$50	\$0	\$210
Presence/absence Survey*	Low	\$0	\$0	\$5,000
	High	\$0	\$400	\$10,000
Informal Consultation/ Non-substantive Re-initiation**	Low	\$1,000	\$1,300	\$2,200
	High	\$3,100	\$4,100	\$6,900
Formal Consultation/ Substantive Re-initiation**	Low	\$3,100	\$4,100	\$6,900
	High	\$6,000	\$6,100	\$9,700
*Surveys not otherwise included as part of formal consultations or project modifications. **Includes costs associated with the preparation of a biological assessment or other biological project evaluation. Notes: Low and high estimates primarily reflect variations in staff wages and time involvement by staff. Technical assistance calls also have educational benefits to the landowner or manager and to the Service. Sources: IEC analysis based on data from the Federal Government General Schedule Rates, 1999, Office of Personnel Management, 2000, and level of effort information from Biologists in the U.S. Fish and Wildlife Service, Carlsbad Fish and Wildlife Office.				

4.4 Estimated Costs of Project Modifications

238. The section 7 consultation process may involve some modifications to a proposed project. These modifications may be agreed upon by the Action agency and the applicant and included in the project description as avoidance and minimization measures, or they may be required by the Service as terms and conditions to implement the reasonable and prudent measures. In some cases, the Service may determine that the project will jeopardize the species or adversely modify its critical habitat. In these cases the Service and Action agency may require the applicant to comply with reasonable and prudent alternatives to the proposed project, develop their own reasonable and prudent alternatives, or seek an exemption for the project. All of these project modifications represent some type of cost to the applicant, as estimated below.

239. This analysis provides estimates of the number and cost of several types of project modifications that are likely to occur as a result of critical habitat designation for the kangaroo rat. These project modifications are anticipated because they have occurred in over half of the eight formal consultations that involved the kangaroo rat.⁹⁷ Although past consultations were conducted

⁹⁷Based on analysis of the Biological Opinions prepared by the Service since August 1995 that consider the kangaroo rat. A complete list is provided in the bibliography.

under the listing of the species under the Act, past modifications required by the Service have focused on habitat considerations, due to the rarity of the species. Therefore, past project modifications are likely to be good predictors of requirements that may result from consultations incremental to the designation of critical habitat for the kangaroo rat.

240. Because the Service usually consults on the kangaroo rat in conjunction with several other species, some project modifications are not entirely attributable to the inclusion of the kangaroo rat in a consultation. For example, past consultations have required that landowners restore alluvial fan sage scrub habitat, used by several endangered species, including the kangaroo rat. In other cases, project modifications are designed to specifically target the kangaroo rat or its habitat. The following list includes project modifications which are partially or wholly attributable to the inclusion of the kangaroo rat, and are likely to be included as a part of consultations on kangaroo rat critical habitat. Cost estimates are provided in Exhibit 4-4.

- C **Conservation Measures.** Almost all of the formal consultations in the past have resulted in the purchase of lands or easements to ensure land is managed for conservation into perpetuity. These efforts were conducted by purchasing "credits" from the Cajon Creek Conservation bank or other similar areas, or by donating conservation easements on portions of the landowner's existing property holdings. This analysis assumes that the applicant will purchase or set aside between five and ten acres of mitigation lands at a cost of approximately \$30,000 per acre in each future formal consultation.⁹⁸
- C **Presence of a Biological Monitor.** In order to ensure that conservation measures are followed and that habitat is protected, the Service often requires the applicant to have a biologist monitor activities prior to and during construction in sensitive areas. This analysis assumes that a biological monitor will be present between five and twenty days for each project. The biological monitor can also install and maintain high visibility fencing around sensitive habitat areas, as is often required by the Service.
- C **Education Programs.** Past formal consultation have required the application to provide education programs to brief each worker at a construction site. These programs generally consist of a short briefing when workers arrive and the preparation of educational booklets.
- C **Habitat Restoration and Enhancement.** In past formal consultation

⁹⁸Personal communication with Manager of Reclamation and Special Projects, Vulcan Materials Company, Western Division on May 25, 2001. Note: This figure includes a fee to ensure the land will be managed for conservation into perpetuity.

processes, habitat restoration and enhancement projects were often conducted for lands that were temporarily disturbed during construction or installation. These restoration efforts generally require preparing a restoration area plan, landscaping the affected areas, and sowing native seeds.

- C **Long Term Monitoring Program.** In order to ensure that the habitat and restoration projects are successful, the Service often requests that the applicant to monitor the temporarily disturbed site for three to five years. The monitor may be required to visit the site between 5 and 30 times over the time period. These visits could involve a brief habitat assessment, the clearing of non-native vegetation, and/or the preparation of a status report.
- C **Project Plan Alterations.** During the consultation process, the applicant may make certain changes in project plans in order to reduce the effects to the species. In past formal section 7 consultations, the Service has requested that the applicant reduce truck speeds when traveling through sensitive habitat, modify its explosives schedule, and restrict construction activities during a defined time of the year. Future plan modifications are dependent on the nature and location of future projects and thus are difficult to predict. This analysis assumes that any deviation from the original plan is likely to involve some economic cost to the applicant.

4.4.1 Significant Project Modifications and Delays

241. Based on the analysis of the eight finalized formal consultations that considered the kangaroo rat, there have been no jeopardy opinions that required significant project modifications or delays through the issuance of reasonable and prudent alternatives. However, the Service issued a draft jeopardy opinion on a water conservation/channelization project in Unit 4 and is currently working with the Action agency to develop reasonable and prudent alternatives to avoid a jeopardy opinion. This analysis assesses the costs of several potential project alternatives including significant project modifications or delays presented by land owners and managers in the critical habitat region. These case studies are not presented to represent all potential significant project modifications. Instead, they are designed to serve as a frame of reference for the types of costs associated with a formal jeopardy opinion.

- C **Significant Project Delay.** Many activities identified in Section 3 are partially or fully funded with Federal funds (e.g., highway improvements, airport development, municipal projects). If a project is delayed beyond the budgeting time horizon of a Federal agency, the funds may become unavailable for a given fiscal year. For smaller projects, this delay could result in the complete loss of the Federal funds. A typical grant for a smaller

project in the critical habitat area could be \$150,000.⁹⁹ For larger projects it is likely that the applicant will apply for the grant again in the following fiscal year. The amount of the grant in the following fiscal year and the applicant's probability of success is difficult to predict as it is highly dependent on the Federal agency's budget, the details of the specific project, and the other projects competing for the grants. However, the applicant and the region could bear costs on the order of costs outlined in this section in project delay costs and the costs to re-apply for the grant.

- C **Alternate Sources for Water Supply.** As identified in Section 3, several water supply activities are likely to occur within the critical habitat designation. If a consultation occurs on one of these activities, a water district may need to reduce its operation in the critical habitat area and obtain water from alternate sources in order to meet its customers' needs. Based on estimates water supply cost presented by several affected water districts, obtaining water from alternate sources could cost as much as \$1 million.¹⁰⁰
- C **Alternate Project Sites.** As identified in this section, the proposed designation of critical habitat may likely to affect many large residential, industrial and commercial projects. A review of local property values for vacant lands in the critical habitat region shows that land within critical habitat is generally less expensive per acre than land outside of critical habitat.¹⁰¹ If a reasonable and prudent alternative requires that a large 50-acre project be moved from low value land within the critical habitat designation to high value land outside of the critical habitat designation, this could result in economic impacts on the order of \$2 million.¹⁰²

242. Significant project modifications and/or delays are not likely to be required for all potential future projects within the proposed critical habitat designation. In fact, only one formal consultation since the listing of the kangaroo rat has resulted in modifications that are likely to cause large costs due to project modifications or delays. Therefore, this analysis assumes that only one out of ten potential future formal consultations will require a significant project modification or delay.

⁹⁹Letter from Best, Best, & Krieger, May 24, 2001.

¹⁰⁰Letter from Best, Best, & Krieger, May 23, 2001.

¹⁰¹Based on analysis of Multiple Listing Service data accessed at <http://century21showcase.com/homesrch.htm> on July 23, 2001.

¹⁰²Letter from Best, Best, & Krieger, May 23, 2001.

243. The typical project modifications listed above are based on an analysis of the formal consultations undertaken since August of 1995. However, it is likely that a significant portion of the future consultations will be informal. As outlined above, this analysis assumes that approximately 75 percent of the future consultations are likely to be informal. In order to remain informal, the Service must agree that all of the effects of the project are insignificant, discountable, or beneficial. It is unlikely that a project will permanently or temporarily impact any measurable amount of kangaroo rat habitat if it meets these requirements. Therefore, for a typical informal consultation, habitat mitigation will not be necessary, and habitat restoration and long term monitoring is likely to involve fewer costs. The project will likely require a biological monitor, but the duration of the project is likely to be shorter. In informal negotiations, it is also likely that more alterations will be made to the project's plan in order to avoid all impacts on the species and its habitat.¹⁰³ Informal consultations are not likely to be subject to other costs associated with "significant" project modifications and delays because the implementation of terms and conditions or reasonable and prudent alternatives is part of the formal consultation process. Thus, formal consultations are usually more costly overall than informal consultations. The cost estimates of project modifications as well as the difference between the informal and formal consultations are presented in Exhibit 4-4.
244. As outlined above, non-substantive re-initiations of section 7 consultations are not likely to affect the ongoing project. However, substantive re-initiations may result in some or all of the project modifications listed above. Therefore, this analysis assumes that the economic impacts of the project modifications associated with substantive re-initiations are likely to fall within the range of costs for formal project modifications presented in Exhibit 4-4.

¹⁰³Based on personal communication with Field Biologist, U.S. Fish and Wildlife Service, Carlsbad CA, on May 23, 2001.

Exhibit 4-4				
ESTIMATED ECONOMIC COSTS ASSOCIATED WITH POTENTIAL PROJECT MODIFICATIONS				
Potential Project Modification (one project)	Informal		Formal/ Substantive Re-initiation	
	Low	High	Low	High
Habitat Mitigation	\$0	\$0	\$150,000	\$300,000
Construction Monitoring and Temporary Fencing	\$2,500	\$5,000	\$2,500	\$10,000
Education Program	\$300	\$1,200	\$300	\$1,200
Habitat Restoration and Enhancement	\$10,000	\$20,000	\$20,000	\$40,000
Long Term Monitoring Program	\$2,500	\$20,000	\$5,000	\$40,000
Project Plan Alterations	\$2,000	\$20,000	\$1,000	\$10,000
Total Project Modification Costs	\$17,300	\$66,200	\$178,800	\$401,200
Significant Project Modifications or Delays	\$0	\$0	\$150,000	\$2,000,000
Source: Based on IEC conversations with Jones & Stokes Associates, Inc., Irvine CA, May 2001 and Dudek and Associates, Encinitas, CA, April 2001 and Letter from Best, Best, & Krieger, May 23, 2001.				

4.5 Total Costs Associated with Designation of Critical Habitat

245. The cost estimates presented in Exhibit 4-5 are a function of the assumed number of actions associated with the critical habitat designation and the cost per impact outlined above. These estimates reflect the assumptions that 75 percent of the future consultations will be completed informally, and that one out of every ten formal consultation will require a significant project modification, as discussed above. These assumptions are based on the historical records of past kangaroo rat consultations.

Exhibit 4-5 SECTION 7 IMPACTS ASSOCIATED WITH THE LISTING AND DESIGNATION OF CRITICAL HABITAT FOR THE KANGAROO RAT (TEN YEARS)					
Critical Habitat Impact	Scenario	Costs to the Service	Costs to the Action Agency	Costs to the Applicant	Total Costs
Technical Assistance Call	Low	\$13,000	\$0	\$7,000	\$21,000
	High	\$21,000	\$0	\$88,000	\$109,000
Presence/absence Survey	Low	\$0	\$0	\$596,000	\$596,000
	High	\$0	\$78,000	\$1,946,000	\$2,024,000
Informal Consultations and Non-substantive Re-initiations	Low	\$131,000	\$171,000	\$289,000	\$591,000
	High	\$663,000	\$876,000	\$1,475,000	\$3,014,000
Formal Consultation and Substantive Re-initiations	Low	\$136,000	\$180,000	\$302,000	\$618,000
	High	\$428,000	\$435,000	\$691,000	\$1,553,000
Informal Project Modifications	Low	\$0	\$0	\$2,209,000	\$2,209,000
	High	\$0	\$0	\$13,803,000	\$13,803,000
Formal Consultation and Substantive Re-initiations Project Modifications	Low	\$0	\$0	\$7,833,000	\$7,833,000
	High	\$0	\$0	\$28,587,000	\$28,587,000
Significant Project Modifications	Low	\$0	\$0	\$657,000	\$657,000
	High	\$0	\$0	\$14,251,000	\$14,251,000
Total Costs	Low	\$280,000	\$351,000	\$11,893,000	\$12,525,000
	High	\$1,112,000	\$1,389,000	\$60,841,000	\$63,341,000
Source: Based on GIS analyses and estimates of local zoning and planning designations as well as information provided by land owners and managers potentially affected by the proposed critical habitat designation.					

246. The cost estimates presented in Exhibit 4-5 are an indication of the total costs that may be associated with the designation of critical habitat over the next ten years including associated protections pursuant to the listing of the species under the Act. In fact, the listing of the kangaroo rat carries significant regulatory weight as discussed in Sections 1 and 2, and is likely to trigger many of the impacts presented above. Thus, many of the technical assistance efforts, section 7 consultations, and project modifications presented in Exhibit 4-5 are likely to occur over the next ten years even if critical habitat is not designated.

247. This report assesses the economic impacts that may be associated with the proposed designation of critical habitat. However, the listing of the kangaroo rat as endangered under the Act may impact development and activities in ways that are not associated with the designation of critical

habitat. For example, section 9 of the Act prohibits take of an endangered species, and section 10 outlines permitting procedures for entities without a federal nexus. Economic costs associated with these impacts are not included in this analysis because they are not related to critical habitat.

248. While the total economic costs associated with the designation of critical habitat and the associated listing impacts appear to be high, they must be considered in the context of the value of the development that is predicted to occur over the next ten years in this region. For example, Exhibit 3-14 indicates that between 7,100 and 9,700 acres of residential land are likely to become urbanized over the next ten years. If this development occurs at the minimum density predicted by the CURBA model (i.e., one dwelling unit every 1.5 acres), this will result in the construction of between 4,700 and 6,500 new homes. Based on an average low-end new home selling value of \$200,000,¹⁰⁴ the total value of this projected development is between \$950 million and \$1.3 billion over the next ten years. The total economic costs associated with residential development activities for the Service, Action agency and third-party applicant combined for the next ten years is between \$2.8 million and \$12 million. Therefore, the total upper end cost of the critical habitat designation and associated listing impacts is less than one percent of the total value of projected residential development.

4.6 Economic Impacts Incremental to the Designation of Critical Habitat

249. The economic costs presented above represent the total projected impacts of the designation of critical habitat and associated listing impacts. However, as discussed above, these impacts are not attributable to the designation of critical habitat alone. In order to assess the costs and benefits of the designation of critical habitat, this analysis must attempt to differentiate between the costs that will likely occur with the designation of critical habitat and the listing, and the costs that would occur absent the critical habitat designation, holding all else equal. The difference between these two costs is the economic impact of the critical habitat designation alone.

250. Several public comments on the proposed rule to designate critical habitat for the kangaroo rat suggest that one possible method to determine the effects of critical habitat alone is to focus on the number of activities that occur on lands occupied by the kangaroo rat. The commentors imply that if an area of critical habitat is unoccupied by the species, then an activity will likely not cause jeopardy to any individual or the species. Therefore, any of the impacts mentioned above on unoccupied lands are likely to be attributable to the designation of critical habitat alone. In order to address this argument, this analysis attempts to assess the costs of the designation of critical habitat alone based on these commentors reasoning.

¹⁰⁴Based on new home list prices in housing developments planned partially or fully within the proposed critical habitat designation accessed at <http://www.centexhomes.com> and <http://www.forecasthomes.com> on July 16, 2001

251. To divide costs based on occupied versus unoccupied lands as suggested by several public commenters, it is necessary to determine how much of the proposed critical habitat is occupied. The Service indicates that the entire critical habitat area is in the geographical area occupied by the species. However, since there are some areas that have not been fully surveyed, it is possible that some regions do not currently contain the kangaroo rat. An extremely low estimate of the number of acres of critical habitat where the kangaroo rat currently exists is the number of acres of land mentioned in the listing as occupied or potentially occupied the kangaroo rat. The acres identified as occupied in the listing will be referred to as "listing-acres" for the remainder of this report. A comparison of the listing-acres and the amount of acres currently designated as critical habitat is presented below in Exhibit 4-6.

Exhibit 4-6							
COMPARISON OF LISTING-ACRES AND CRITICAL HABITAT ACRES							
	Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6	Total
Acres of land identified as suitable and occupied kangaroo rat habitat in the listing	6,949	8,107	1,352	5	5	2	16,420
Acres of land designated as critical habitat	12,074	20,621	10,104	9,502	319	2,788	55,408
Difference	5,125	12,514	8,752	9,497	314	2,786	38,988
Listing acres as a percentage of critical habitat acres	57.6%	39.3%	13.4%	0.1%	1.6%	0.1%	29.6%
Source: U.S. Fish and Wildlife Service, <i>Proposed Designation of Critical Habitat for the San Bernardino kangaroo rat</i> , December 8, 2000 (65 FR 77177).							

252. If it is assumed that any impact on the land identified as occupied in the listing is attributable to the listing, and that any impact on the additional acres identified as critical habitat is attributable solely to critical habitat, then the number of impacts presented in Section 3 must be reduced by the percentage of listing-acres presented in Exhibit 4-6 in order to determine the solely critical habitat impacts. For example, all of the potential development acres and activities for Unit 1 must be reduced by 57.6 percent. These reductions remove the activities that would be impacted due to the listing. If the remaining impacts are assumed to be attributable to the designation of critical habitat alone, the resulting economic cost of critical habitat designation to the Service, the action agencies,

and the applicants is between \$8.7 million and \$44.3 million.¹⁰⁵

253. However, this is an overstatement of the economic costs attributable to the designation of critical habitat alone, because the assumption that all of the impacts outside of the listing-acres are fully attributable to critical habitat is not supported by the historical record. Prior to the designation of critical habitat, the Service conducted formal and informal consultations on sites outside of the areas considered occupied in the listing because suitable habitat existed there. The August 16, 1999, consultation on improvements to State Route 30 considered impacts to potential kangaroo rat habitat in Claremont, which is ten miles west of any area included in the listing-acres.¹⁰⁶ The formal consultation on the San Sevaine Water Project that was initiated prior to the designation of critical habitat considers impacts to areas of Unit 4 that are south of the five acres identified as listing-acres. Therefore, it would be an overstatement to assume that all impacts to activities outside of the listing acres are attributable solely to the critical habitat designation.

254. A more accurate method to determine the economic impacts of the designation of critical habitat is to assess how the designation provides new information to Federal agencies that initiate the consultation process. Conversations with ACOE staff in charge of initiating the section 7 process indicates that 950 acres (approximately five percent) in the upper reaches of the Lytle and Cajon Creeks in Unit 2 and all of Unit 6 are new information regarding the areas where a section 7 consultation for the kangaroo rat may be necessary.¹⁰⁷ In addition, ACOE staff indicates that it has historically considered a list of criteria when considering whether a section 7 consultation is necessary for a particular project. These criteria include information from existing surveys, the known locations of kangaroo rats, the habitat downstream from the project, the historic relationship with the applicant, the impacts to alluvial fan sage scrub habitat, prior usage of the land, and the level of degradation at the site.¹⁰⁸ The designation of critical habitat will add one more standard to this criteria list to help ACOE staff determine whether a consultation is necessary. While the impact of critical habitat can only accurately be determined on a case by case basis, this analysis assumes that

¹⁰⁵This figure include the costs associated with all of the projected re-initiations of completed section 7 consultations because the re-initiations will only occur with the designation of critical habitat.

¹⁰⁶Letter to U.S. Department of Transportation from U.S. Fish and Wildlife Service. Re: Re-initiation of Formal Section 7 Consultation and Revision of Biological Opinion on State Route 30 Improvements Project, San Bernardino Co., CA. August 16, 1999.

¹⁰⁷Facsimile from U.S. Army Corps of Engineers, Seven Oaks Dam Resident Office, to IEc. Re: SBKR Critical Habitat. May 11, 2001

¹⁰⁸Based on personal communication with Ecologist, U.S. Army Corps of Engineers, Seven Oaks Dams Resident Office, on May 10, 2001 and Ecologist, U.S. Army Corps of Engineers, Los Angeles Office on May 15, 2001.

between ten and 20 percent of the projects that would not have been subject to section 7 consultation based on the listing criteria above will result in consultation after the designation of critical habitat for the kangaroo rat.

255. Based on these assumptions, between ten and 20 percent of the potential development and activities for Units 1, 3, 4, and 5 were included. Between 15 and 25 percent of the impacts in Unit 2 were included and all of the impacts in Unit 6 were included. Therefore, through new information and additional consultation criteria, the critical habitat designation is estimated to trigger section 7 consultations on between approximately 17 and 27 percent of the entire critical habitat area. Exhibit 4-7 provides estimates of the economic costs associated with the designation of critical habitat independent of any listing impacts over the next ten years.

Exhibit 4-7					
ECONOMIC COSTS ASSOCIATED WITH THE DESIGNATION OF CRITICAL HABITAT INDEPENDENT OF LISTING EFFECTS (TEN YEARS)*					
Critical Habitat Units	Scenario	Costs to the Service	Costs to the Action Agency	Costs to the Applicant	Total Costs
Unit 1	Low	\$10,000	\$13,000	\$409,000	\$433,000
	High	\$65,000	\$81,000	\$3,417,000	\$3,564,000
Unit 2	Low	\$20,000	\$25,000	\$806,000	\$850,000
	High	\$115,000	\$143,000	\$6,122,000	\$6,379,000
Unit 3	Low	\$4,000	\$5,000	\$156,000	\$164,000
	High	\$30,000	\$37,000	\$1,644,000	\$1,711,000
Unit 4	Low	\$5,000	\$6,000	\$207,000	\$218,000
	High	\$41,000	\$51,000	\$2,231,000	\$2,322,000
Unit 5	Low	\$0	\$0	\$10,000	\$10,000
	High	\$2,000	\$3,000	\$114,000	\$119,000
Unit 6	Low	\$11,000	\$14,000	\$484,000	\$510,000
	High	\$52,000	\$64,000	\$2,834,000	\$2,950,000
Total	Low	\$50,000	\$63,000	\$2,072,000	\$2,185,000
	High	\$305,000	\$379,000	\$16,362,000	\$17,045,000
<p>*Note: The costs associated with substantive and non-substantive re-initiations were assumed to occur in Units 1 and 2 because majority of the past section 7 consultations were conducted in reference to projects within these two units. Source: Based on GIS analyses and estimates of local zoning and planning designation as well as information provided by land owners and managers potentially affected by the proposed critical habitat designation.</p>					

4.7 California Environmental Quality Act (CEQA) Impacts

256. Section 15065 of Article 5 of the CEQA regulations state that a lead agency must prepare an Environmental Impact Report (EIR) for projects that "substantially reduce the habitat of a fish and wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of an endangered, rare or threatened species, or eliminate important examples of the major periods of California history or prehistory." As discussed the baseline portion of Section 2, the designation of critical habitat for the kangaroo rat is not likely to cause any incremental costs associated with CEQA for lands that are known to be kangaroo rat or other wildlife species habitat. As discussed in the previous section, however, the proposed designation of critical habitat may provide new information about areas that are within the geographical area occupied by the kangaroo rat. Thus, the designation of critical habitat may increase the knowledge about the range of the kangaroo rat for project developers and permitting agencies. As a result, the designation of critical habitat may result in some incremental activities and economic costs associated with CEQA.
257. In order to assess the economic impacts of the critical habitat designation associated with the CEQA regulations, this analysis must first determine how many projects are likely to be impacted by the designation. Exhibit 4-1 estimates a range of the number of large projects that are likely to occur in the proposed critical habitat designation based on socioeconomic trends, local zoning and planning efforts, and conversations with land owners and managers in the region. This analysis assumes that all of these projects will likely be considered "projects" in the CEQA process.¹⁰⁹
258. Many of the projects within the proposed critical habitat will likely require the preparation of an EIR because they impact biological and environmental resources unrelated to the kangaroo rat. The coastal California gnatcatcher and the Santa Ana woolly star are two federally listed species that exist within the proposed critical habitat designation for the kangaroo rat. In addition, the critical habitat contains a large portion of the remaining alluvial fan sage scrub habitat in southern California. However, this analysis assumes that critical habitat will provide new information to public agencies about the extent of the kangaroo rat habitat on between 17 and 27 percent of the proposed critical habitat designation. In these areas, critical habitat may trigger the preparation of an EIR that may not have happened without the designation of critical habitat.
259. The preparation of a EIR is likely to involve certain economic costs for project managers. To develop an estimate of these costs, this analysis considered the results of a mail survey that asked California respondents to estimate the total preparation cost of all EIRs completed in 1990. For the

¹⁰⁹California Resources Agency, "How does a Public Agency determine whether an activity is a "project" under CEQA?," November, 1998. Accessed at <http://ceres.ca.gov/ceqa/flowchart/project.html> on May 30, 2001.

188 respondents who answered the question, the average 1990 cost of an EIR was \$38,124.¹¹⁰ Adjusting for inflation, this analysis assumes that the low range of the economic cost for each project that requires an EIR is approximately \$50,000. The CEQA regulations are constantly changing and the preparation of an EIR today and in the future may be more expensive. Based on reports of the recent costs of the preparation of an EIR, the average high range cost is likely to reach \$100,000. The lead agency may suggest that a project manager makes certain changes to a project or purchase land to mitigate impacts on sensitive biological resources. These project modifications and mitigation purchases can be used to satisfy the requirements of both the section 7 consultation process as well as the CEQA process. The costs associated with section 7 impacts are considered in detail above, and thus to avoid counting the costs twice, the costs are not included in this section.

260. Exhibit 4-8 summarizes the number of potentially impacted projects and the total CEQA costs associated with the designation of critical habitat.

Exhibit 4-8					
POTENTIAL CEQA IMPACTS ASSOCIATED WITH CRITICAL HABITAT DESIGNATION					
	Total Projects	Percentage of Projects Incrementally Impacted	Number of Critical Habitat EIR's	EIR Costs	Total Incremental Costs
Low	263	16.75%	44	\$50,000	\$2,200,000
High	419	26.75%	112	\$100,000	\$11,200,000
Source: Based on information provided by the California Resources Agency CEQA website accessed at http://ceres.ca.gov/ceqa/ in May 2001 and John D. Landis et al. <i>Fixing CEQA: Options and Opportunities for Reforming the California Environmental Quality Act (Brief)</i> , California Policy Research Center, University of California, November 1995 Accessed at http://www.ucop.edu/cprc/ceqa.html on October 9, 2000.					

261. Based on the information provided in Exhibit 4-5, 4-7 and 4-8, the total costs of the listing and critical habitat within the proposed boundaries of the critical habitat designation are summarized below in Exhibit 4-9.

¹¹⁰John D. Landis et al. *Fixing CEQA: Options and Opportunities for Reforming the California Environmental Quality Act (Brief)*, California Policy Research Center, University of California, November 1995. Accessed at <http://www.ucop.edu/cprc/ceqa.html> on October 9, 2000.

Exhibit 4-9		
COMBINED COSTS OF KANGAROO RAT LISTING, CRITICAL HABITAT, AND CEQA WITHIN PROPOSED CRITICAL HABITAT DESIGNATION (TEN YEARS)		
Total Costs <i>Including</i> Listing Effects		
Costs associated with section 7	Low	\$12,525,000
	High	\$63,341,000
CEQA costs	Low	\$2,200,000
	High	\$11,200,000
Total critical habitat costs	Low	\$14,725,000
	High	\$74,541,000
Total Costs <i>Independent of</i> Listing Effects		
Costs associated with section 7	Low	\$2,185,000
	High	\$17,045,000
CEQA costs	Low	\$2,200,000
	High	\$11,200,000
Total critical habitat costs	Low	\$4,385,000
	High	\$28,245,000
Source: GIS analyses and estimates of local zoning and planning designation as well as information provided by land owners and managers potentially affected by the proposed critical habitat designation.		

4.8 Potential Impacts on Small Businesses

262. Under the Regulatory Flexibility Act, as amended by the Small Business Regulatory Enforcement Fairness Act (SBREFA) of 1996, whenever a Federal agency is required to publish a notice of rulemaking for any proposed or final rule, it must prepare and make available for public comment a regulatory flexibility analysis that describes the effect of the rule on small entities (i.e., small businesses, small organizations, and small government jurisdictions).¹¹¹ However, no regulatory flexibility analysis is required if the head of an agency certifies that the rule will not have a significant economic impact on a substantial number of small entities. SBREFA amended the

¹¹¹ 5 U.S.C. 601 et. seq.

Regulatory Flexibility Act to require Federal agencies to provide a statement of the factual basis for certifying that a rule will not have a significant economic impact on a substantial number of small entities.

263. As estimated in Section 3, the proposed critical habitat designation has the potential to impact between approximately 1,500 and 2,200 acres of developable commercial land. In addition, the proposed critical habitat may impact two counties, 11 cities, at least 11 water districts, and several other small planning organizations. The economic impacts associated with the section 7 consultation process and the CEQA regulations are presented above. Small businesses, small organizations and small government jurisdictions are likely to incur costs associated with the critical habitat designation if they are the applicants in a section 7 consultation. Under CEQA, small entities are encouraged to address threatened habitat issues for projects they carry out or permit. However, in practice, small governmental jurisdictions may be involved in a slightly larger number of CEQA processes due to the critical habitat designation.

264. In the past, landowners, builders, and construction employees and their representatives have asserted that critical habitat designations may result in lost employment and lost tax revenue.¹¹² This analysis estimates that several additional consultations in the future may result from the designation of critical habitat, some of which are likely to involve private contractors. However, past consultations on the kangaroo rat have resulted in recommendations that mitigation lands are purchased in exchange for destruction of kangaroo rat habitat, rather than that limitations on a project's scope. Rather than reducing labor needs, additional labor and materials may be required to fulfill requirements of a consultation with the Service, such as those listed above. Therefore, the net effect of the critical habitat designation on future employment is unclear.

265. As with employment, the net effect of critical habitat on tax revenues is not clearly positive or negative. For example, as mentioned above, the section 7 process could result in a reasonable and prudent alternative that requires portions or an entire large development to be moved from low value land to high value land. This requirement may make it un-economical for the development to proceed and thus reduce the tax base of the city. However, the development may proceed on the high value land and increase the municipal tax base beyond what it was prior to the critical habitat designation. Therefore, the net effect of the critical habitat designation on tax revenues will depend on the specific implementation of future significant project modifications.

4.9 Potential Impacts Associated with Property Values

266. Private landowners often express the concern that critical habitat designation will lead to

¹¹² Comments provided by the BIA of Southern California/BILD Foundation, March 20, 2001 on the *Draft Economic Analysis for the Riverside Fairy Shrimp*.

reductions in property values within the extant boundaries of the designation. These concerns relate to (1) expectations regarding the regulatory burden associated with critical habitat that may be borne by owners of such property (e.g., additional consultations with Action agencies, the cost of biological surveys, etc.), or (2) the potential that the market will stigmatize such property, given uncertainties regarding the limitations critical habitat designation may place on the use of such property. An example of the first type of effect is as follows:

A property owner is considering selling a parcel of land, valued at \$2 million prior to the designation. The most likely use of the parcel, once sold, is for residential development. At a \$2 million sale price, the projected costs of the expected development (including a normal profit) are equal to the projected benefits, such that potential buyers would be indifferent to developing the land. Before the sale takes place, a portion of the parcel is designated as critical habitat. Given the nature of the parcel, it is expected that the development will generate a consultation with the Service, and that a biological survey and minor project modification will be required. The total cost of these requirements is expected to be \$30,000. These added costs are likely to make development of the parcel uneconomical, given the availability of substitute parcels for developers to purchase that are not within critical habitat. Therefore, the property owner is unable to sell the parcel at the original expected price.

Since the critical habitat designation is public knowledge, the property owner will only be able to sell the land for \$1,970,000, or its fair market value of prior to the designation minus the \$30,000 in additional development costs. At this price, the new property owner will be able to develop the land, including meeting all requirements of critical habitat, without suffering adverse economic effects associated with the designation of critical habitat, since the economic costs of the designation were incorporated in the sale price. Thus, the appropriate measure of economic effect in this case is the \$30,000 loss incurred by the original property owner.

267. This example does not include economic impacts associated with market inefficiencies, imperfect information about the effects of critical habitat, transaction costs of selling the land, and potential delays of the project construction. For example, in cases in which numerous substitute parcels are available in the market, the value of parcels within critical habitat, all else equal, may be significantly less, pending the market gaining additional information on the true cost of the designation (i.e., information about the types of requirements that will be placed on land owners and managers as a result of the designation). Alternatively, the "time-on-market" for such parcels may be greater. However, this example also does not factor into account the ability of developers to modify their plans, and thus avoid some of the potential costs associated with critical habitat designation. For example:

A developer considering the property mentioned above is considering two

development options. The first option is identical to the one described above, with the costs equal to the benefits at the initial land price of \$2,000,000. The second option involves more open space, to avoid sensitive habitat. The cost of this option is \$10,000 more than the benefits to the developer. The first option is more attractive than the second option, from an economic perspective, in the absence of critical habitat. However, given critical habitat, if the developer proceeds with the first option, the economic impact will be \$30,000. However, if the developer selects the second option, critical habitat will not be impacted, and thus a consultation with the Service will not be necessary. In this scenario the developer would be willing to pay \$1,990,000, and the expected cost of the designation would be only \$10,000, the reduced value to be paid to the original landowner.

268. In this second scenario, a developer was able to avoid \$20,000 of costs by changing his project plans and avoiding impacts to designated, but unoccupied, critical habitat. Recent studies support the idea that the actual economic impacts after the designation of critical habitat are less than the predicted impacts.¹¹³ However, in order to present a conservative estimate of the cost of the designation of critical habitat, no reductions to the total costs estimates presented above are made.

¹¹³Bruce McKenney, "Economic Activity Following Critical Habitat Designation for the Cactus Ferruginous Pygmy-Owl," prepared for the Coalition for Sonoran Desert Protection in October, 2000.

POTENTIAL BENEFITS OF PROPOSED CRITICAL HABITAT

SECTION 5

269. To determine the benefits of critical habitat designation for the kangaroo rat, this report considers those categories of benefit that will be enhanced as a result of the listing of the species and the proposed critical habitat designation.
270. The primary goal of listing a species under the ESA is to preserve the listing species and the ecosystems upon which they depend. However, various economic benefits, measured in terms of regional economic performance and enhanced national social welfare, result from species preservation as well. Regional economic benefits can be expressed in terms of jobs created, regional sector revenues, and overall economic activity. For example, conservation purchases that occur as part of the section 7 consultation process helps to fuel the mitigation banking industry. The Cajon Creek Conservation bank and Wildlands, Inc., are two examples of mitigation banking organizations that benefit from consultations.¹¹⁴ National social welfare values reflect both use and non-use (i.e., existence) values, and can reflect various categories of value. For example, use values might include the opportunity to see kangaroo rat tracks or burrows while on a hike, or the recreational use of habitat area preserved as a result of the kangaroo rat. Existence values are not derived from direct use of the species, but instead reflect the satisfaction and utility people derive from the knowledge that a species exists.
271. The following examples represent potential benefits derived from the listing of the kangaroo rat and, potentially, critical habitat:

¹¹⁴Personal communication with Manager of Reclamation and Special Projects, Vulcan Materials Company, Western Division on May 25, 2001 and Wildlands, Inc. website, accessed at <http://www.wildlandsinc.com/> on May 30, 2001.

- C Ecosystem health.** Kangaroo rats are likely an integral part of the alluvial fan sage scrub ecosystem. Absent the kangaroo rat, other natural organisms may suffer. Actions to protect the kangaroo rats may also benefit other organisms. Each one of these organisms may provide some level of direct or indirect benefit to people.
- C Existence Value.** People place value on knowing that a particular species exists and is protected from extinction. This value is a non-consumptive value because it is not necessarily derived from seeing or touching the animal.
- C Real estate value effects.** Real estate values may be enhanced by critical habitat designation. For example, such enhancement may occur to properties adjacent to or with views of open space or if allowable densities do not increase over current levels as a result of critical habitat designation.

272. The benefits identified above arise primarily from the protection afforded to the kangaroo rat under the Federal listing. Critical habitat designation may provide some incremental benefits beyond the listing benefits. Critical habitat designation provides some educational benefit by increasing awareness of the extent of kangaroo rat habitat. Surveys, consultations, and project modifications conducted as a result of the designation of critical habitat are likely to increase the probability of the conservation of the kangaroo rat. Critical habitat also provides a legal definition of the extent of kangaroo rat habitat. This reduces the amount of uncertainty Federal agencies face when determining if a section 7 consultation is necessary for an activity with a Federal nexus.

273. The quantification of total economic benefits attributable to the designation of critical habitat is, at best, difficult. Without knowing the exact nature of future consultations and associated project modifications, it is difficult to predict the incremental increase in the probability that the kangaroo rat will recover as a result of critical habitat designation. A single project modification associated with the designation of critical habitat may increase the probability of recovery for the kangaroo rat. While such a scenario may be unlikely, such a hypothetical project modification would bear a portion the economic value of the existence of the kangaroo rat as mentioned above. Alternatively, consultations associated with the designation of critical habitat may not increase the probability of recovery for the species. In this case, the incremental benefits of designating critical habitat for the kangaroo rat would be limited to the educational benefits, increased support for existing conservation efforts, and reduced uncertainty regarding the extent of kangaroo rat habitat. In all likelihood, the real benefit of the designation of critical habitat for the kangaroo rat will lie between the benefits presented in these examples.

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APPENDIX A

The following chart contains brief descriptions of the land use categories used in the California Department of Water Resources 1993 Upper Santa Ana River Land Use Survey.

Appendix A	
GENERAL LAND USE CATEGORY DESCRIPTIONS	
Land Use Category	Description
Urbanized land	Residential, commercial, industrial and vacant land.
Residential	Single and multiple family units, including trailer courts.
Commercial	Offices, retailers, hotels, motels, recreation vehicle parking, campsites, institutions, schools, municipal auditoriums, theaters, churches, stadiums, amusement parks, etc.
Industrial	Manufacturing, assembling, and general processing; extractive industries (oil fields, rock quarries, gravel pits, rock and gravel processing plants, etc.); storage and distribution; waste accumulation sites, etc.
Urban landscape	Lawn area, golf course, ornamental landscape, cemeteries.
Urban vacant	Unpaved areas (vacant lots, graveled surfaces, play yards, developable open lands within urban areas, etc.); railroad right of way; paved areas (parking lots, paved roads, oiled surfaces, flood control channels, tennis court areas, auto sales lots, etc.); airport runways.
Agricultural Land	Cropland, pasture, orchards, vineyards, idle or fallow lands.
Citrus and Sub-tropical	Grapefruits, lemons, oranges, dates, avocados, olives, kiwis, jojoba, eucalyptus.
Crops	Includes grain and hay crops (barely, wheat, oats, etc.); field crops (cotton, safflower, flax, hops, corn, sunflowers, etc.); truck, nursery and berry crops (artichokes, asparagus, carrots, celery, lettuce, potatoes, cabbage, tomatoes, strawberries, etc.); and deciduous fruits and nuts (apples, apricots, cherries, figs, almonds, walnuts, etc.).
Idle	Land not cropped the current or previous crop season, but cropped within the past three years; or new lands being prepared for crop production.
Pasture	Alfalfa, mixed pasture, native pasture, misc. grasses (normally grown for seed), turf farms, etc.
Vineyards	Table grapes, wine grapes, and raisin grapes.
Semiagricultural	Farmsteads, livestock feedlots, dairies, poultry farms.
Habitat and Other Land	Native vegetation, water surface or barren land.
Barren and Wasteland	Dry stream channels, mine tailing, and barren land.
Vegetation	Native grass land, brush, forest, and riparian vegetation.
Water Surface	Lakes, reservoirs, rivers, canals, etc.
Source: California Department of Water Resources. "Standard Land Use Legend". July 1993.	